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GO ALRT PROGRAM

GO ALRT LAND USE SCENARIOS

March 1983

IBI Group

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GO ALRT LAND USE SCENARIOS

A Report Describing Estimates of Future Population and Jobs Throughout the Greater Toronto Area For Use in Preparing Ridership Demand Estimates for the GO ALRT Inter-Regional Rapid Transit System

Prepared for the

ONTARIO MINISTRY OF TRANSPORTATION AND COMMUNICATIONS
GO ALRT PROGRAM

by

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March, 1983

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March 21, 1983

Mr. D. G. Smith
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Dear Mr. Smith:

GO ALRT Land Use Scenarios

Enclosed herewith is our report on the above subject. It was prepared in response to your Terms of Reference dated January 12, 1983, and in accordance with our proposal of January 17 and the letter of agreement dated February 14, 1983.

We have attempted to provide a fairly complete discussion of the assumptions underlying each scenario and the factors taken into account in developing each, as well as the actual estimates of population and employment at the level of the Greater Toronto Area, each of its six regional municipalities, and the more detailed 50 zone system representing area municipalities and some subdivisions thereof.

Owing to the length of the report, a brief summary is presented at the beginning, providing an indication of the report's structure and the exhibits which should be referred to for a description of the four scenarios.

We wish to acknowledge with thanks the strong cooperation of the planning staffs of the six regional municipalities throughout the last few weeks of intensive work in developing these scenarios. Their comments and advice were invaluable and provide a degree of realism to the scenarios which would otherwise not be possible. At the same time, however, we wish to clarify that responsibility for the scenarios rests entirely with the MTC and its consultant for this work and not with the regional municipalities.

It should also be stressed that none of the scenarios presented herein is intended to be a "most likely" forecast of future development in the Greater Toronto Area. Rather, each scenario is a self-consistent construct

of one possible "future", developed as a basis for establishing a range of ridership estimates for the GO ALRT system. Scenarios A and C provide a reasonable basis, we feel, for estimating design requirements for the system, while Scenarios B and D provide a basis for estimating operating requirements and financial performance.

It is recognized that these are preliminary estimates and further, more detailed studies of both land use and ridership will be carried out as planning work proceeds for the system. A number of suggestions along these lines are made at the end of the report, and comments are also made regarding the broad implications of each scenario for travel behaviour.

On behalf of myself and Ms. Marianne Thompson who assisted in this work, I wish to thank you for the opportunity of assisting the GO ALRT program on this important project, and we trust that the land use scenarios presented in this report will be of continuing use in the planning process.

Yours sincerely

IBI GROUP

Neal A. Irwin
Managing Director.

NAI:wp

GO ALRT LAND USE SCENARIOS

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SUMMARY

This report presents four land use scenarios for the Greater Toronto Area as a basis for preliminary estimates of ridership on the GO ALRT inter-regional rapid transit system. The scenarios are developed for the years 1991, 2001, 2011 and 2021. Each scenario comprises estimates of population and employment for a system of 50 zones comprising area municipalities and subdivsions thereof for the larger municipalities. Distributions of population and employment are also shown for each scenario at the regional municipality level.

Following a brief discussion of the purpose of the report, the process of developing the scenarios, and the context within which they were developed as presented in Chapter 1, there is a rather extensive discussion of the assumptions and factors underlying each scenario and quantitative estimates of population, employment and related factors at the level of the entire Greater Toronto Area, in Chapter 2. Chapter 3 presents a discussion of factors taken into account in estimating growth distribution among the six regional municipalities in the Greater Toronto Area and a description of the regional distributions. Chapter 4 presents a similar discussion of underlying factors and the estimated distribution of people and jobs at the 50 zone level. Chapter 5 presents a brief discussion of anticipated travel implications of the land use scenarios, and Chapter 6 presents concluding comments on the status and use of the land use scenarios and possible further work.

The reader who wishes to review the overall growth levels of the four scenarios at the Greater Toronto Area level is directed to Exhibit 4 for a tabular portrayal and Exhibit 5 for a graphic portrayal. Similarly, a tabular summary of regional distributions under the two scenarios is presented in Exhibit 8 while Exhibits 9A and 9B show regional population trend lines and Exhibit 10 regional employment trend lines, both in graphical form. A map of the 50 zone system is presented in Exhibit 13, with population estimates at the 50 zone level in Exhibits 14A and 14B and employment estimates at the 50 zone level in Exhibit 15.

GO ALRT LAND USE SCENARIOS

1. INTRODUCTION

1.1 Purpose

The Ministry of Transportation and Communications (MTC) of the Province of Ontario announced in October 1982 an inter-regional rapid transit strategy under which Advanced Light Rail Transit (ALRT) routes and services are to be provided throughout the Greater Toronto Area (GTA). This Area comprises the six Regional Municipalities of Metropolitan Toronto, Durham, York, Peel, Halton and Hamilton-Wentworth.

The system, referred to as the GO ALRT system, will provide rail transit service in the Lakeshore corridor from downtown Metropolitan Toronto westward to the centre of the City of Hamilton and eastward to the centre of the City of Oshawa. Light rail extensions, using the advanced LRT technology developed by the Urban Transportation Development Corporation (UTDC) will be used to construct extensions from Pickering eastward to Oshawa and from Oakville westward to Hamilton, with these extensions scheduled to begin service in 1986 and 1987, respectively. Initially, the service from downtown Toronto to Pickering and Oakville, respectively, will continue to be provided by the existing GO rail commuter service, with riders transferring to the ALRT service at Pickering and Oakville. It is intended that the Lakeshore section between Pickering and Oakville will eventually be provided with ALRT lines such that continuous ALRT service will be available throughout the entire Lakeshore corridor. A second ALRT line, referred to herein as the North Line, will provide east-west service through a corridor in northern Metropolitan Toronto and extending eastward to Pickering and westward to Oakville. While staging details have yet to be worked out, central sections of the North Line are likely to be brought into operation during the 1990's, followed during that decade or shortly thereafter by extensions to the west and to the east. Construction of the central Lakeshore section is expected to follow construction of the North Line.

A map showing broadly the corridors to be served by the GO ALRT system is presented in Exhibit 1.

As part of the planning process for this extensive system, it is necessary to prepare ridership and revenue estimates. This, in turn, requires estimates of future land use, by which we mean the distribution of population and jobs throughout the Greater Toronto Area, and related factors such as lifestyles and travel behaviour. It is, of course, impossible to predict with accuracy the rate of growth of an urban area or the manner in which this growth will be distributed spatially, owing to the many factors influencing such development. It is, however, possible to examine the factors underlying urban development, analyze the manner in which these have influenced past development, and estimate alternative future development possibilities, each based upon a reasonably consistent set of assumptions. The term "land use scenario" is used in this report to describe each alternative set of assumptions and the resulting estimates of population and jobs throughout the study area.

The purpose of this report is to describe four long range land use scenarios which have been developed for the Greater Toronto Area for the years 1991, 2001, 2011 and 2021. The 1991 estimates had been prepared earlier by the MTC and this report therefore focusses on the longer range estimates for the three subsequent decades.

The report presents each scenario in quantitative form, showing the overall levels of estimated population and employment (and related variables) for the entire Greater Toronto Area, the manner in which people and jobs are expected to be distributed among the six regional municipalities, and a more detailed distribution of estimated growth to 50 analysis zones, comprising area municipalities or portions thereof, for each of the scenarios. Equally important, the report describes the underlying assumptions and factors for each scenario, in an attempt to provide the reader with a rationale for each. The report also provides a discussion of the manner in which travel behaviour may be influenced under the various land use scenarios, and concludes with a few comments on the use of each scenario as a basis for GO ALRT ridership demand estimates.

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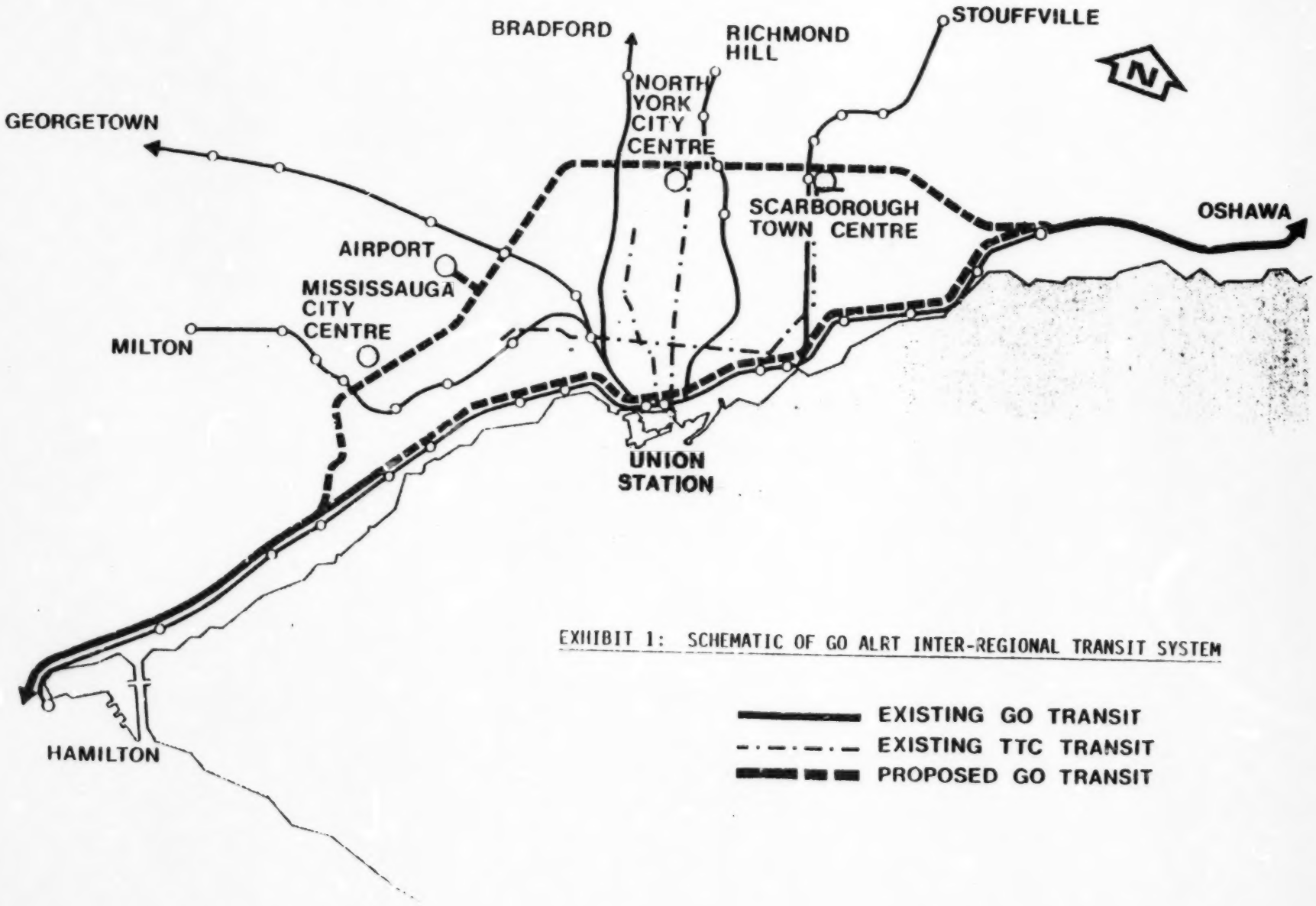

EXHIBIT 1: SCHEMATIC OF GO ALRT INTER-REGIONAL TRANSIT SYSTEM

1.2 The Context

During the past year a number of estimates of likely future development in the Greater Toronto Area have been made. For example, the Toronto Area Liaison Committee (TALC), comprising representatives of the six regional municipalities, the Ontario Ministry of Municipal Affairs and Housing (MMAH) and the MTC, carried out a Common Perspectives Study during the summer and early fall of 1982 in order to study alternative development possibilities to the year 2001. Four scenarios were developed, ranging in population from a low of about 4.1 million persons to a high of almost 5 million persons, by the year 2001. At the same time, MTC staff developed two longer range scenarios, to the year 2021, as a basis for ridership demand estimates as part of the Lakeshore GO Rail Electrification Study. One of these "GO Electrification" scenarios, known as the "Growth" scenario, had a growth rate intermediate between that of the highest and second highest scenarios developed in the Common Perspectives Study to 2001, with an accelerated rate of growth thereafter; the other "Trends" GO Electrification scenario had an estimated population about mid-way in the range of the Common Perspectives Scenarios for the year 2001, with a relatively moderate rate of growth thereafter.

The assumptions and thinking underlying all of these earlier scenarios were considered in developing the GO ALRT scenarios presented herein, but the GO ALRT Scenarios represent new thinking based upon more recent planning information and, very importantly, the anticipated impact of the GO ALRT system itself on development rates and patterns throughout the GTA.

3.1 The Process

While the scenario development work described in this report was an MTC project, the existence of TALC and the very considerable amount of thinking which its members had done regarding alternative development scenarios provided an excellent basis for bringing to bear the combined expertise and thinking of planners representing the six regional municipalities, the two provincial ministries, and their consultants. IBI and its Managing Director, Neal Irwin, were retained in the latter capacity by the MTC,

again building upon their similar role on behalf of TALC in the Common Perspectives Study.

The scenarios were developed during a six week period ending in early March, 1983. During this period, the consultant developed "draft" scenarios, initially at the GTA level, subsequently distributed among the six regional muncipalities, and finally distributed at the 50 zone level. These estimates were brought to meetings of TALC or a sub-committee known as the TALC Working Group at approximately weekly intervals for discussion and comment, particularly in light of official plans and other planning estimates prepared by the regional municipality planning staffs. In this manner the thinking and experience of the latter were brought to bear within the context of underlying assumptions and growth factors postulated by the consultant. While the process was a cooperative one, it should be stressed that the scenarios were developed by the MTC and its consultant specifically for the purpose of developing GO ALRT ridership estimates as a basis for testing the feasibility, design parameters and operating requirements of the proposed inter-regional rapid transit system. Responsibility for the scenarios therefore rests with the MTC and its consultant rather than with the regional municipalities.

The process outlined above applied particularly in the development of two of the scenarios, designated as Scenarios A and B. Towards the end of the process, a number of considerations led to development of the two additional scenarios, designated Scenarios C and D. The scenarios are generally discussed as pairs in that there is a strong similarity between Scenarios A and C and between Scenarios B and D, respectively. Each pair has identical GTA totals for population and employment and identical distribution of employment among the six regional municipalities and the 50 zones. Scenarios A and C differ only in the distributions of population for the years 2001, 2011 and 2021, while Scenarios B and D differ only in the distributions of population for the same years. The reasons for developing Scenarios C and D, in order to take these differences into account, are discussed further in Sections 3.1 and 4.2.

2. GROWTH SCENARIOS FOR THE GREATER TORONTO AREA

2.1 Likely Land Use Impacts of GO ALRT System

The four land use scenarios developed under the TALC Common Perspectives Study, as noted earlier, ranged from a high of 4.9 million persons under Scenario 1 to a low of 4.1 million persons under Scenario 4, by the year 2001. Scenario 1 was based on a resumption of the relatively high fertility levels and bouyant economic growth rates experienced during the 1960's and 1970's. Scenario 4, on the other hand, assumed relatively low fertility levels, negligible levels of net in-migration and depressed levels of economic growth. All of the scenarios produced by the Common Perspectives Study were "non-interventionist", in that they assumed no major government interventions beyond infrastructure improvements or economic policies which had already been announced by mid-1982.

The GO ALRT land use scenarios, however, must take into account the impact of the GO ALRT system itself, both as a major public enterprise creating jobs and related economic activity, and as a trunk transportation system influencing the rate and distribution of development in the area served.

In developing these scenarios we assume that the GO ALRT system, as broadly described in Section 1.1 above, is likely to have impacts such as the following on development in the Greater Toronto Area:

- it will increase overall GTA convenience, efficiency and attractiveness;
- it may therefore have a positive impact on population and employment growth in the Greater Toronto Area through:
    - o providing more accessibility and therefore greater opportunities for both housing and employment choice to residents;
    - o providing a greater pool of skilled labour accessible to employers, particularly located downtown and at regional centres/subcentres;

- it will tend to influence the distribution of population and employment within the area:

  - more people and jobs are likely to locate at nodal points of both the GO ALRT and existing rail transit systems, particularly downtown but also at other regional centres served by one or both systems;

  - construction staging of GO ALRT will likely impact development rates in relevant corridors: for example, early introduction of the North Metro Line would likely have a positive impact on growth in North Metro, Peel and South York Regions.

These assumptions were used in selecting overall estimated GTA growth levels for the two pairs of GO ALRT scenarios, as outlined in the following section.

2.2 Selection of GO ALRT Scenarios

We conclude, based on the assumptions outlined in the previous section, that positive impacts of the GO ALRT system would tend to favour scenarios in the upper half of the range defined by the four scenarios of the TALC Common Perspectives Study. Therefore we conclude that the higher of the two pairs of GO ALRT scenarios should reflect overall conditions as anticipated by TALC Scenario 1 and the MTC GO Electrification "Growth" Scenario. The other pair of GO ALRT scenarios should reflect a more modest rate of growth, to show the impact of continuing economic problems but in the context of positive government actions including the GO ALRT system. This suggests that the lower pair of GO ALRT scenarios should reflect overall conditions as anticipated in the range established by TALC Scenarios 2 and 3 and the MTC GO Electrification "Trends" Scenario.

There is another strong rationale for selecting two pairs of scenarios as above. The higher of the two pairs of GO ALRT scenarios, Scenarios A and C, provide a strong ridership basis for assessing design parameters for the GO ALRT system. The lower pair of GO ALRT scenarios, Scenarios B and D, provide a basis for operational planning and financial assessment of the GO ALRT system. In other words, Scenarios A and C represent an "up-side" assessment of ridership levels which the system

should be designed to accommodate eventually on a staged basis, while Scenarios B and D provide a more conservative basis for estimating likely ridership revenues, operating levels and related financial requirements.

None of the scenarios is seen necessarily as "most likely" and none reflects an official view of the Province or the regional municipalities, although Scenario A tends to reflect recent planning estimates by planning staffs of the six regional municipalities more closely than do the other scenarios.

2.3 Factors Underlying GO ALRT Scenarios

In order to provide a consistent set of assumptions for each scenario, in terms of overall GTA growth rates and distributions of growth to the regional municipalities and smaller zones, we systematically assessed a series of factors under the following headings:

Demographics

- fertility rates
- in-migration
- population aging

Economics

- real income levels
- energy prices
- interest rates/inflation

Employment

- participation rates
- employment rates
- manufacturing growth
- growth of regional cores

Technology

- job decentralization
- working at home
- use of efficient urban autos

Lifestyles

- housing choice
- household size
- females in workforce

Residential Development

- redevelopment/infill at development nodes
- density of new development
- exurban development

Travel Behaviour

- car ownership/utilization
- commuting trip lengths
- work trip peaking
- growth of leisure trips
- growth of education trips

Our assumptions regarding each of these items, for each pair of scenarios, respectively, are summarized in Exhibit 2. The symbols H, M and L, designating high, medium and low, respectively, reflect relative levels between the two pairs of scenarios. Our thinking in terms of each factor is outlined briefly in the remainder of this section.

EXHIBIT 2

FACTORS UNDERLYING GO ALRT SCENARIOS

FACTORS	GO SCENARIOS A AND C	GO SCENARIOS B AND D
DEMOGRAPHICS		
- FERTILITY RATES	M-H	M
- NET IN-MIGRATION	H	M
- POPULATION AGING	M	H
ECONOMICS		
- REAL INCOME LEVELS	H	M
- ENERGY PRICES	M	M-H
- INTEREST RATES/INFLATION	L	M-H
EMPLOYMENT		
- PARTICIPATION RATES	H	M
- EMPLOYMENT RATES	H	M
- MANUFACTURING GROWTH	H	M
- GROWTH OF REGIONAL CORE	H	M-H
TECHNOLOGY		
- JOB DECENTRALIZATION	M	M-L
- WORKING AT HOME	H	M
- USE OF EFFICIENT URBAN AUTOS	M	M-H
LIFESTYLES		
- HOUSING CHOICE	H	M
- HOUSEHOLD SIZE	L	M
- FEMALES IN WORKFORCE	M	M
RESIDENTIAL DEVELOPMENT		
- REDEVELOPMENT/INFILL (NODAL)	H	M
- DENSITY OF NEW DEVELOPMENT	M	M-H
- EXURBAN DEVELOPMENT	M-H	M-L
TRAVEL BEHAVIOUR		
- CAR OWNERSHIP/UTILIZATION	H	M
- COMMUTING TRIP LENGTHS	H	M
- WORK TRIP PEAKING	M-L	M
- GROWTH OF LEISURE TRIPS	H	M
- GROWTH OF EDUCATION TRIPS	M-H	H

Demographics

Fertility Rates

The designation of a medium-high fertility rate for Scenarios A and C and a medium fertility rate for Scenarios B and D is in line with the designations used in recent cohort survival projections being carried out by the Ontario Ministry of Treasury and Economics and by staff of the Metropolitan Toronto Planning Department. The low, medium and high fertility assumptions used in those projections for the period 1981-2021 are shown in Exhibit 3. While the population estimates of the GO ALRT scenarios are not directly based on these projections (the two exercises were carried out in parallel), Scenarios B and D correspond quite closely to the medium fertility assumptions of Exhibit 3 and Scenarios A and C correspond to an assumed fertility level about mid-way between the medium and high fertility assumptions of that exhibit, with both pairs of scenarios having a somewhat lower fertility level than those during the first decade of the planning period.

Both the medium and high fertility levels assume a continuing decline in fertility which bottoms out by 1996 in the medium fertility situation and climbs very slowly back to 1981 levels by 2021, while the increase starts sooner (by 1991) under the high fertility situation and reaches a break-even level (that is, 2,000 births per 1,000 women of childbearing age) during the latter 2 1/2 decades of the planning period. It should be pointed out, however, that the effect of lower than break-even fertility levels is masked under both scenarios by the high number of women of childbearing age in the population during the 1980's and 1990's as a result of the "baby boom" of the 1950' and 1960's. After the baby boom passes through the family formation years, the effects of low fertility will be sharply felt and overall population levels in the GTA would decline during the last decade or two of the planning period, in the absence of net in-migration. These effects are discussed more quantitatively in the following section.

It should be pointed out that the "high" fertility level is still low in the context of fertility levels experienced during this century

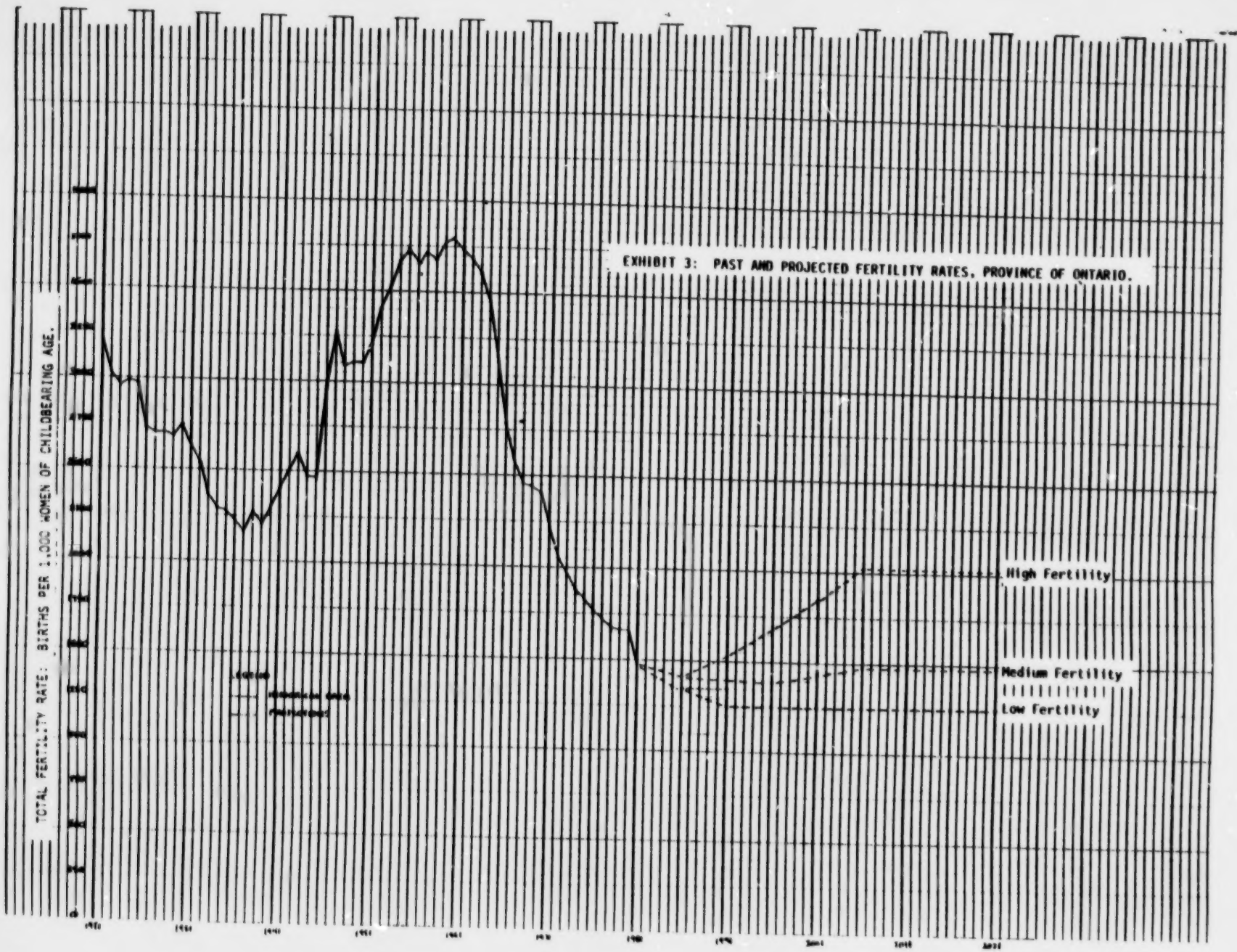
EXHIBIT 3: PAST AND PROJECTED FERTILITY RATES, PROVINCE OF ONTARIO.
TOTAL FERTILITY RATE: BIRTHS PER 1,000 WOMEN OF CHILDBEARING AGE.
High Fertility
Medium Fertility
Low Fertility

prior to 1970, as shown by the historical fertility levels in Exhibit 3. Both projections of fertility levels underlying the two pairs of scenarios assume a continuation at least during the next 10 years of the declining trends experienced during the 1960's and 1970's, and both assume that this decline will eventually bottom out at a level somewhat less than 1,400 births per 1,000 women. They differ in that the medium level assumes a more or less stable fertility rate (rising slightly to 1,483), while the high fertililty level assumes a recovery to the 2,000 level. For comparison, the low fertility level used by the Ministry of Treasury and Economics assumes a continuing slow decline, to a level of 1,167 births per 1,000 women of childbearing age, by 2021, as also shown in Exhibit 3.

It is, of course, very difficult to foresee how these trends will actually unfold. Fertility levels in Canada and other western countries dropped to fairly low levels during the depression years of the 1930's (the low for Ontario was 2,161 births per 1,000 women in 1937) and rose to high levels (above 3,000) following the Second World War. High levels were sustained during the 20 years of buoyant growth experienced after the war, with a high in Ontario of 3,793 in 1960. The dramatic drop in the mid-1960's can be attributed to widespread use of "the pill" and related social and economic phenomena including massive entry of women into the labour force. Biological trends, and indeed the affairs of human and animal societies, generally are cyclical in nature; in this context, it seems quite reasonable that fertility levels in the GTA would recover to something less than the break-even level under the buoyant conditions of Scenarios A and C, and would stabilize at more modest levels under the slower economic growth conditions of Scenarios B and D during the forecast period. It is important to note that, under both fertility assumptions, the natural increase of the population living in the GTA as of 1981 (that is, disregarding any net in-migrants) would cease by shortly after 2021 in the A and C Scenarios and by shortly between 2011 in the B and D Scenarios, and would become a natural decrease thereafter. The importance of net in-migration to sustain population growth under both pairs of scenarios is therefore very strong.

Net In-Migration

The extent to which population migration into a region exceeds migration out of the region can be extremely volatile, varying substantially from year to year largely in response to economic forces. For example, net migration into the Province of Ontario was high during the years following the Second World War and remained high during the 1960's and early 1970's, sustained by both foreign immigration and migration from other parts of Canada, in particular Atlantic Canada. The Greater Toronto Area was a strong magnet to migrants from other countries, attracting in the order of 45% of them during the 1950's and 1960's when Canada was admitting as many as 200,000 foreign immigrants per year. The attraction of the GTA no doubt related to its size, economic opportunities and the fact that existing enclaves of "ethnic" peoples provided cultural and family bonds to assist new immigrants. During the 1960's, approximately three quarters of the net migrants to the Province of Ontario were attracted to the GTA, at an average annual rate of 48,000. During the decade ending 1981, however, the average annual net in-migration to the GTA was much lower (18,000), reflecting a steep drop during the latter part of the 1970's as Ontario's economy lost some of its buoyancy and migrants were attracted to the booming economies of the three western provinces, particularly Alberta. In 1981, Ontario experienced a net out-migration of about 10,000 persons. While we do not yet have statistics for 1982, there are indications that this trend may have reversed itself in the face of the sharp drops in economic growth experienced in the West, particularly in Alberta and British Columbia, during late 1981 and 1982.

In the A and C Scenarios we assume that the annual net in-migration will recover to levels intermediate between those of the 1960's and the 1970's, averaging about 26,000 persons per year during the 1980's, 34,000 during the 1990's, 35,000 during the first decade of the next century and about 33,000 during the second decade. The B and D Scenarios assume net in-migration of about 11,000 persons per year during the 1980's, 28,000 during the 1990's, and 27,000 and 31,000 per year during the subsequent two decades respectively.

In order to sustain such levels of in-migration, the GTA must retain its attractiveness in terms of economic opportunities and its other strong amenities in terms of physical and social infrastructure, etc. It seems likely that these attractions will continue to make the GTA a preferred location for foreign immigrants and probably for many migrants from other parts of Canada, although this will depend heavily on recovery and continuing growth of the area's secondary industries, as discussed further below.

The higher levels of net in-migration assumed in Scenarios A and C presuppose an increase in permitted levels of foreign immigration from those of recent years. This is a factor beyond the control of provincial and local governments; such a relaxation, however, would be compatible with the buoyant economic conditions assumed in Scenarios A and C and would, to a considerable extent, contribute to them by providing an increased base for population-serving jobs and workers to fill many such jobs.

Population Aging

Under the B and D Scenarios, it is estimated that the percentage of the population in the 65 years and over age bracket will increase from about 9% in 1982 to about 23% by 2021. This reflects both the effects of low fertility levels and the arrival of the "baby boom" into the "senior citizen" category during the second decade of the next century. The aging of the population is less exteme under the A and C Scenarios because of higher fertility levels and more net in-migration, but even in those scenarios the proportion of the population 65 years or older by 2021 is likely to be more than double what it was in 1982 (eg. about 20%). This aging process would be much more extreme without the substantial in-migration assumed in both scenarios, since migrants are traditionally younger than the average population age and also tend to produce more offspring.

As more people move into the over 65 category the percentage of retired persons in the population will increase, thereby reducing the relative number of people of working age in the population. This, in turn, is likely to stabilize or reduce the labour force participation rate (the

ratio of those employed or actively seeking employment to the total population). There will be more people living on fixed retirement incomes and there may be a shortage of certain types of skilled workers. The aging of the population will also impact lifestyles and travel behaviour, as noted further below.

Economics

Real Income Levels

Real income levels have been stagnant during much of the past decade, under the impact of the severe 1981/83 recession and earlier "stagflation" conditions. This, in turn, has affected consumer demand, home-ownership and a variety of other economic and social variables.

Under Scenarios A and C we assume that real income levels will resume the upward trend experienced during the first part of the 1970's, as our secondary manufacturing industry recovers and productivity levels are increased. A somewhat more modest level of increase in real income levels is assumed in Scenarios B and D.

Energy Prices

Energy prices have increased sharply during the past few years, but have stabilized under the impact of declining demand and a current oversupply situation. In Scenarios A and C we assume that energy prices will stabilize in real terms during the 1980's and will resume a modest rate of increase (1-2% per year) thereafter. In Scenarios B and D we assume that price stability will be more short-lived and a somewhat higher rate of increase (2-4% per annum) will resume during the latter half of the 1980's and thereafter. These assumptions assume political stability in the Middle East and other major oil producing regions, and a continuation of successful gas and oil exploration activities in Canada and elsewhere.

Inflation and Interest Rates

Inflation rates in the U.S., Canada and other western countries have reduced substantially during the past 12 months under the influence of

the current recession. Under Scenarios A and C we assume that inflation will stabilize at relatively low rates (3-5% per annum) over the forecast interval and at somewhat higher rates (5-7% per annum) under the B and D Scenarios. Interest rates are assumed to be approximately 2-4% higher, on average, than the inflation rate.

These assumptions are consistent with a smooth recovery from the present recession, with government exercising sufficient financial restraints to avoid a resurgence of inflation. They are also consistent with relatively stable energy prices as noted above, a resumption of growth in productivity levels, and relatively stable prices of food and other natural resources. Disruptions such as over-inflationary government policies, a mid-east war or other interruption of oil supplies, or a series of bad harvests with substantially increased food prices, would tend to produce higher rates of inflation than assumed here, with a likely downward impact on the rate of economic growth.

Employment

Participation Rates

The labour force participation rate measures the proportion of the total population which is employed or actively seeking employment. This has been climbing during the past few decades, from percentages in the mid-forties in 1971 to the low fifties in 1981, reflecting rapid entry of women into the labour force and the impact of the baby boom in raising the proportion of the total population who are of working age. We see this increasing trend continuing at a reduced level in both pairs of scenarios, followed by a decline in the participation rate reflecting the substantial growth in the proportion of retired persons in the latter two decades of the planning period. For example, in Scenarios B and D the proportion of the population of ages 15-64 years is expected to drop from 70% in 1982 to about 63% in 2021 with a somewhat smaller drop in Scenarios A and C to about 62% owing to the greater in-migration in these scenarios. The peak participation rate of 0.552 is assumed to be reached by 2011 in Scenarios A and C, falling slightly by 2021. A lower peak of 0.532 by 1991 is estimated for Scenarios B and D, falling to 0.524 by 2011 and 0.519 by

2021. The lower participation rates in Scenarios B and D reflect the greater aging of population in these scenarios and the assumption that less buoyant economic times will lead younger people to continue their education longer (therefore entering the labour force later) and others to give up actively seeking employment.

Employment Rates

The ratio of the labour force (those employed or actively seeking employment) to the number of jobs available is termed the employment rate. When subtracted from 100%, it gives the unemployment rate which, as is well known, is now running in excess of 12% in Canada. During the past three decades, employment rates have more commonly been in the range of 95-97%, and even at the end of the recession year 1981 the rate was as high as 93.7% in the GTA. In Scenarios A and C we see a gradual increase from 94.8% in 1991 to 96% in 2021, with somewhat lower rates in Scenarios B and D, increasing slowly from 93.9% in 1991 to 95% in 2021.

The employment rate is very much a function of the rate of growth of jobs as well as of the labour force growth rate. Estimating the growth of jobs is particularly difficult at this time in our economic history since, while Canada is particularly blessed with natural resources, a skilled labour force and other requirements of economic growth, the severe recession of 1981-1983 has wiped out several hundred thousand jobs in Southern Ontario alone, many of them basic manufacturing jobs, and has shaken our confidence regarding continuing strong growth in the Canadian economy. While strong continuing growth of the population-serving job sector (non-basic jobs) can be expected with reasonable confidence, there is more uncertainty regarding the rate of growth of manufacturing jobs, as discussed below.

Manufacturing Growth

The Greater Toronto Area, and Southern Ontario of which it is the leading economic region, comprise the industrial heartland of Canada. Within the GTA the automotive industry, farm machinery, electrical products, chemicals, metals, textiles and a host of other basic industries are

strongly represented. The future expansion of these industries from their present under-capacity utilization depends strongly on the world economy, competion from developing countries, receptiveness of export markets to our products, technological innovation by Canadian companies, tariff and non-tariff barriers to trade, and other factors which are largely beyond the control of local governments.

The A and C Scenarios assume a resurgence of high growth in our manufacturing industries, consistent with a recovery of the world economy and both export and domestic markets for manufactured products. The B and D Scenarios assume substantial recovery in manufacturing industries of the GTA, but at a more modest level reflecting the continuing penetration of off-shore products into the Canadian market and less buoyant economic conditions in general.

The rate of growth of manufacturing and other basic employment is the most important single variable, along with population growth, in determining development rates and characteristics in the GTA. Logically, construction of growth scenarios should start with estimates of future job levels, taking into account manufacturing industries, financial and commercial employment, and population-serving employment. Owing to the current economic uncertainties, however, "official" economic forecasts for more than a few years into the future are not available and it is difficult to produce a convincing "model" of economic growth. We have therefore taken the approach, in constructing the GO ALRT scenarios, of estimating future population levels based on assumptions regarding fertility and migration levels, and matching these with consistent estimates of jobs, based on plausible assumptions regarding participation and employment rates, as noted earlier. There is a degree of predictability for future population levels, based upon the relative stability of fertility levels and the time it takes for changes in fertility to work their way through the population as it ages. As noted earlier, the rate of net in-migration is a much more volatile variable and, in fact, reflects a population response to economic conditions. Our assumption of strong economic growth in Scenarios A and C is therefore the key to achieving the high net migration rates required to

achieve the population levels postulated for those scenarios. If the GTA is not able to achieve such buoyant rates of job creation, less in-migration is likely and conditions more like those of Scenarios B and D would be likely to prevail.

Growth of Regional Cores

Both pairs of scenarios assume strong growth of financial and related commercial employment in downtown Toronto, reflecting Toronto's role as financial capital of Canada. We see little reason to doubt that this role will continue even if economic recovery is not as strong as might be hoped, and the strength of employment and income levels in downtown Toronto in spite of the current deep recession provides supporting evidence for this.

As shown in Exhibit 2, growth of employment in downtown Toronto is expected to be higher in Scenarios A and C than in Scenarios B and D, while remaining strong in both pairs of scenarios. A similar situation is anticipated for other regional cores in the GTA, including Hamilton, Oshawa, Mississsauga, North York, Oakville and smaller sub-regional centres.

Technology

Job Decentralization

As the GTA has grown, there has been a tendency for jobs to decentralize, reflecting lower land prices, greater room for expansion, easier highway access and related advantages of suburban locations. On the other hand, less land-extensive types of employment, in particular office employment, have shown less tendency to decentralize and, indeed, there has been a strengthened concentration of financial and related employment in downtown Toronto as noted above.

In looking to the future, we see a moderate rate of continuing job decentralization in Scenarios A and C, reflecting the strong economic growth of those scenarios, and a lower rate of job decentralization in

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Scenarios B and D, reflecting fewer new plants and offices and a lesser tendency of existing establishments to move out to the suburbs, under less favourable economic conditions.

The increasing availability of inexpensive computer/telecommunications technology is also expected to contribute to this difference between the two pairs of scenarios. The wider availability of relatively inexpensive word processors, personal computers and data links will make it more economical for some companies to locate certain types of office workers in less expensive suburban office space, linking them to the downtown head office with data communications links. While not seen to be a major factor, this trend may result in the transfer of several thousand jobs over the next two or three decades from downtown Toronto to other regional sub-centres. This is expected to happen to a somewhat greater extent in Scenarios A and C than in Scenarios B and D, reflecting the greater availability of capital funds in Scenarios A and C. We expect, however, that the powerful growth of downtown Toronto in Scenarios A and C, as noted in the previous section, will greatly overshadow this technological impact during the period under consideration.

Working at Home

The same technological developments in computers and communications are making it more and more feasible for certain types of professional and office support workers to work at home, with data links to one or more office locations. Using the same reasoning as outlined in the previous subsection, we assume that this tendency will be somewhat higher in Scenarios A and C than in Scenarios B and D. It is difficult to quantify a development as new as this. It may be that as many as 10-15% of office workers might be working at home by 2021 in Scenarios A and C, with perhaps up to 10% in this category in Scenarios B and D. These estimates are, however, highly conjectural.

Use of Efficient Urban Autos

This is another technological development which should be considered in terms of its impact on development patterns and travel behaviour. Smaller, more energy efficient automobiles have penetrated the consumer

market very strongly since the first oil price increases of 1973/74 and even more strongly since the oil shortfalls of 1979. We suggest that this trend will continue, reflecting the current relatively high prices of gasoline, but the trend will be less strong in Scenarios A and C owing to the more stable energy prices and higher growth of real incomes in those scenarios. The fact that more energy-efficient and less costly automobiles are and will be available for urban use will likely contribute to continuing trends in higher auto ownership by female members of the labour force. It is not at all clear, however, that this would necessarily reduce the use of GO ALRT by such people. While there might be some reduction for short trips with convenient destination parking, it is quite possible that longer trips using the GO ALRT system will be more feasible with increased car ownership which allows use of the park 'n ride mode combination.

Lifestyles

Housing Choice

The amount of choice in housing available to persons wishing to rent or buy housing accommodation is a function of variables such as real income, available varieties of housing and neighbourhoods to choose from, and the quality of transportation available. As noted in Section 2.1, for example, the GO ALRT system itself will add significantly to housing choice in the GTA by providing greater inter-regional accessiblity via public transportation and thereby extending the area within which a worker can live while remaining within, say, 45 minutes' travel of his work place.

We assume that housing choice will be high in Scenarios A and C, reflecting the high real incomes, high car ownership, strong housing construction and good transportation accessibility inherent in this scenario. Housing choice would be somewhat less wide in Scenarios B and D owing to lower real income levels and lower car ownership levels, although existence of the GO ALRT system will help contribute to a reasonable level of housing choice.

Household Size

The average number of people per household in the GTA has decreased from 3.41 in 1971 to 2.89 in 1981, and a decreasing trend can be anticipated during the next few years at least in response to continuing trends of one or two children per family, single parent families, and single persons living alone, particularly those in the expanding group 65 years or older in age. We therefore assume that household size will drop to 2.75 in 1991, 2.65 in 2001 and stabilize at 2.60 in the following two decades, under Scenarios A and C. We assume that this stabilization will occur sooner and at a higher level (2.70 by 2001 and thereafter) in Scenarios B and D, reflecting the impact of lower increases in real incomes and higher interest rates under that scenario. These factors would make it relatively harder for single individuals to live away from the nuclear family and would probably lead to less "undoubling" or more "doubling up" in Scenarios B and D than in Scenarios A and C. These assumptions affect the number of households and the rate of household formation in the two pairs of scenarios, such that there would be an estimated 2.31 million households by 2021 in Scenarios A and C and 1.944 million households in Scenarios B and D. Apart from the implications of this difference for the house construction industry, it is likely that there would tend to be more ex-urban development in Scenarios A and C to meet this requirement for new households, and less tendency for population decentralization in Scenarios B and D, as discussed in the following sub-section under Residential Development.

Females in Work Force

We assume that participation of females in the work force will be similar under the two scenarios and that the influx will tend to saturate during the next decade or so. It might be argued that there would be marginally more females in the work force in Scenarios B and D because of the lower fertility levels in those scenarios but this tendency would probably be cancelled out by the lesser job opportunies available in Scenarios B and D. We suggest that the major momentum of increasing numbers of females in the work force has already been felt and that changes in the Participation

Rate in future decades will respond more to economic conditions (availability of jobs), aging of the population (a greater proportion of retired people) and a tendency of younger persons to take more years of education if job opportunities are limited; as discussed earlier under the title Participation Rate, the latter tendencies are considered to be more likely in Scenarios B and D, leading to slightly lower participation rates in those scenarios.

Residential Development

Redevelopment/Infill at Nodal Points

As a major metropolitan area grows there is a general tendency for infill, that is for vacant land surrounded by urban development to be developed. We suggest that this tendency will be higher in Scenarios A and C than in Scenarios B and D, particularly for new land in the suburbs, mainly because the greater development pressures of Scenarios A and C will drive up land prices more and make it more attractive to landholders to subdivide and develop properties which had been held for other purposes. This tendency is more likely to occur at nodal points in both scenarios, that is, in regional sub-centres or at other points which have relatively high accessibilities owing to roads or public transit services. Construction of the GO ALRT system will tend to encourage infill and redevelopment of existing urbanized land around GO ALRT stations, which will in turn contribute to ridership on the system through increased densities and greater convenience of station access. This factor is taken into account in the small zone estimates as described in Chapter 4 below.

Density of New Development

We assume that the density of new develoment in Scenarios A and C will be somewhat less than that under Scenarios B and D. This is because, while land prices are expected to be somewhat higher under Scenarios A and C (thereby tending to lead to higher densities of development) the market will be able to absorb greater numbers of single family dwelling units in Scenarios A and C, owing to higher real incomes and lower interest rates. Conversely, in Scenarios B and D we anticipate a somewhat greater tendency

towards multiple unit housing and small single family houses, in response to lower levels of consumer purchasing power. Again, these tendencies are taken into account in the small zone estimates presented in Chapter 4 below.

Ex-Urban Development

As noted earlier, we assume a somewhat higher level of residential development in areas at the fringe of existing urbanization under Scenarios A and C than under Scenarios B and D. This reflects the higher land prices, higher real incomes, lower gasoline prices and higher car ownership of Scenarios A and C relative to those in Scenarios B and D. Again, this assumption is taken into account in the small zone estimates.

Travel Behaviour

Car Ownership/Utilization

As noted earlier, we assume that car ownership and utilization will be higher under Scenarios A and C than under Scenarios B and D, reflecting the higher real incomes, lower interest rates, lower gasoline prices and greater ex-urban development under the former scenario.

Commuting Trip Lengths

For the same reason, and given the greater extension of urbanized areas in Scenarios A and C, we anticipate that commuting trip lengths will be longer under Scenarios A and C than under Scenarios B and D, within the overall trend to increased trip lengths as the GTA continues to develop. This factor is discussed more fully in Chapter 5 below.

Work Trip Peaking

The proportion of work trips which occur in the morning and evening peak hours is a function, on the demand side, of the types of employment and resulting work hours and, on the supply side, of peak hour congestion and the extent to which people spread their trips in an effort to

avoid it. Relative peaking is also a function of off-peak characteristics and accessibility levels provided by the transportation system; for example, attractive service levels and fares in the off-peak may attract more patrons to a public transportation system at non-peak times, thereby improving the system's revenue/cost ratio under some circumstances.

We anticipate that work trip peaking will be slightly less under Scenarios A and C than under Scenarios B and D, partially because of peak spreading due to higher levels of peak hour road congestion, and partly due to the greater variety of job types and working hours likely to occur under Scenarios A and C. An example of the latter is the anticipated higher level of working at home under Scenarios A and C and the expectation that four day work weeks might be more likely to occur under the more buoyant economic conditions of those scenarios. On the other hand, the higher growth of population in the suburbs and greater concentrations of employment in downtown areas, as anticipated under Scenarios A and C, may be expected to provide a much stronger directional imbalance (in-bound in the morning and out-bound in the evening) under Scenarios A and C than under Scenarios B and D, thereby contributing to greater directional peaking under the former scenarios.

Growth of Leisure Trips

A somewhat higher level of leisure trip making is anticipated under Scenarios A and C than under Scenarios B and D, primarily reflecting the higher real incomes, higher car ownership and lower gasoline prices of Scenarios A and C. A countering influence would be the greater percentage of retired persons under Scenarios B and D, who presumably have more time for leisure trips. On the other hand, there will be a large number of retired persons under both pairs of scenarios (about 1.2 million in all four scenarios) and they will probably have more money to spend on leisure activities under Scenarios A and C than under Scenarios B and D. On balance, therefore, we anticipate slightly more leisure trip making in the former pair of scenarios.

Growth of Education Trips

A higher rate of trip making for educational purposes is anticipated under Scenarios B and D, primarily because of the expectation, as noted earlier, that more young people may be anticipated to extend their years of education because of fewer immediate job opportunities available under Scenarios B and D. These educational trips would tend to contribute also to a slightly sharper morning traffic peak under Scenarios B and D, since they tend to occur at the same time as the work trip peak.

Travel behaviour characteristics of the two pairs of scenarios are discussed further in Chapter 5 below, as they are likely to impact GO ALRT ridership in particular. The above comments are generally applicable to all modes of travel, although with some modal distinctions as noted.

2.4 Quantification of GO ALRT Scenarios at the GTA Level

Exhibit 4 presents for each scenario at the GTA level estimates of population, participation rate, labour force, employment rate, employment (jobs), household size and number of households. As can be seen, Scenarios A and C have an estimated GTA population of just over 6 million people by 2021, while Scenarios B and D have a population of about 5 1/4 million people by that year. Scenarios A and C would have about 3.2 million jobs by the horizon year while Scenarios B and D would have about 2.6 million jobs. As noted earlier, Scenarios A and C would have about 2.3 million households and Scenarios B and D about 1.9 million households. The respective trends and values of participation rates, labour force, employment rates and household size reflect the assumptions described in the previous section.

Also shown in Exhibit 4 are approximate estimates of the natural increase in the base year population. As mentioned earlier, this is estimated by taking the GTA population of 1981 and "growing" it with a cohort survival model and the assumed fertility levels discussed in Section 2.3, calculating births and deaths on an annual basis and assuming zero migration. This shows very clearly the impact of less than break-even fertility

EXHIBIT 4

ESTIMATED G.T.A. GROWTH LEVELS AND RELATIONSHIPS

		BASE YEAR	GO ALRT SCENARIOS A AND C				GO ALRT SCENARIOS B AND D			
VARIABLES	1971	1981	1991	2001	2011	2021	1991	2001	2011	2021
POPULATION	3.324M	3.829M	4.362M	4.997M	5.542M	6.005M	4.147M	4.591M	4.943M	5.265M
PARTICIPATION RATE	(0.457)	0.527	0.543	0.545	0.552	0.550	0.532	0.531	0.524	0.519
LABOUR FORCE	(1.518)	2.018M	2.368M	2.724M	3.060M	3.304M	2.206M	2.436M	2.585M	2.718M
EMPLOYMENT RATE	(0.960)	0.937	0.948	0.955	0.957	0.960	0.939	0.944	0.948	0.950
EMPLOYMENT (JOBS)	1.457M	1.891M	2.245M	2.601M	2.928M	3.172M	2.073M	2.300M	2.451M	2.582M
HOUSEHOLD SIZE 2.89	3.41	2.89	2.75	2.65	2.60	2.60	2.75	2.70	2.70	2.70
NO. OF HOUSEHOLDS	0.975M	1.324M	1.586M	1.886M	2.132M	2.310M	1.508M	1.700M	1.828M	1.939M
NATURAL INCREASE OF BASE YEAR POPULATION (000'S)	386	298	258	170	100	5	198	102	-9	-131
APPROXIMATE NET IN-MIGRATION* IN PREVIOUS 10 YEARS (000'S)			275	417	460	477	120	322	349	430
APPROXIMATE ANNUAL NET IN-MIGRATION IN PREVIOUS 10 YEARS (000'S)	48	18	26	34	35	33	11	28	27	31

( ) Numbers in parentheses are approximate estimates for 1971.

* Including natural increase of all in-migrants from 1981 onwards.

levels once the baby boom gets beyond child-bearing age: under Scenarios A and C the base year population would start to decrease in absolute terms shortly after the year 2021 and under Scenarios B and D it would start to decrease shortly before 2011.

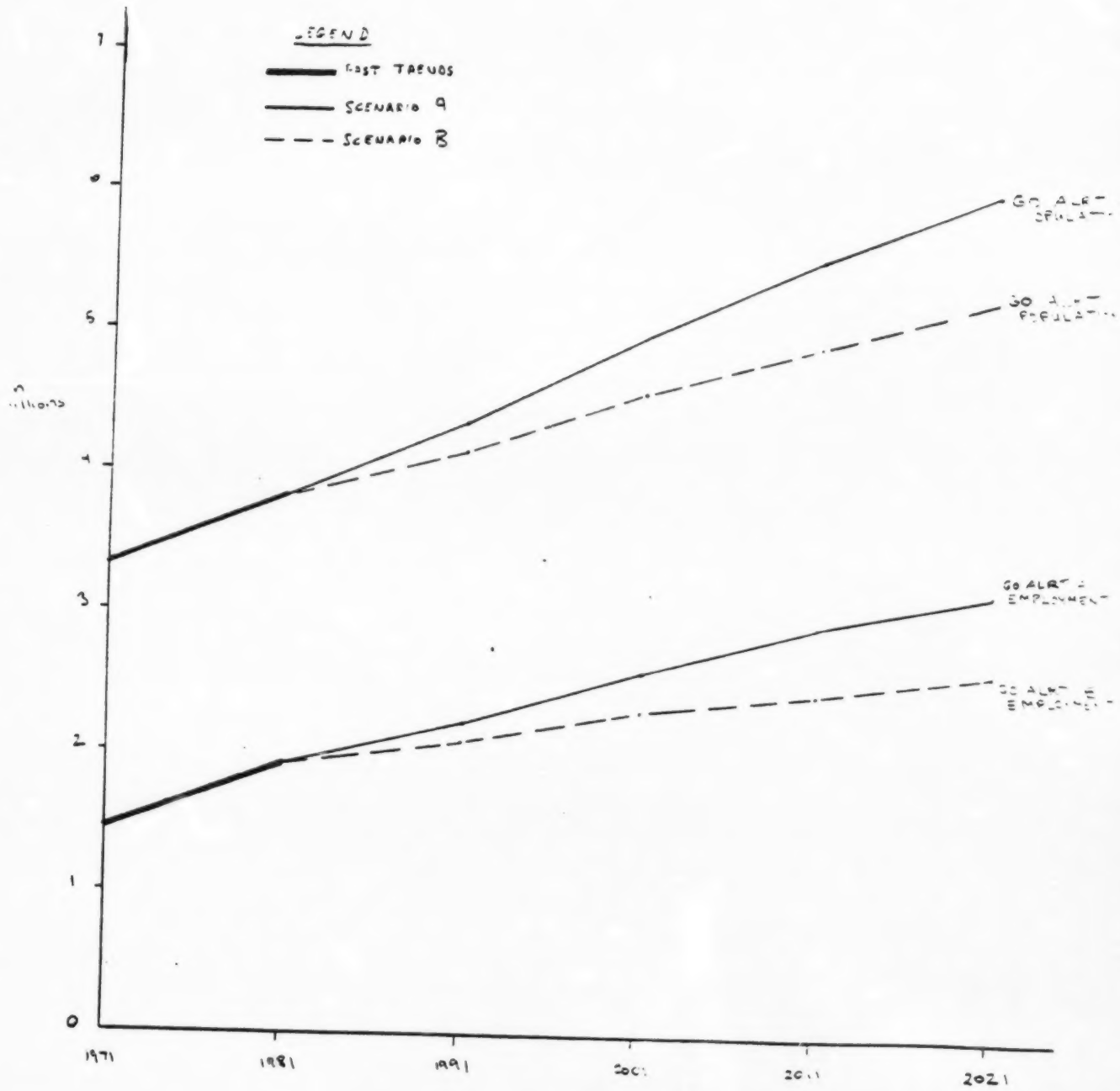
The next row of Exhibit 4 shows the overall impact of net in-migration assumptions. This shows, for example, that under Scenarios A and C by 1991 net in-migration would have contributed 275,000 persons to the GTA population, including both the in-migrants themselves and their offspring born during the period 1981-1991. During the next decade net in-migration would contribute some 417,000 persons, including new in-migrants in the decade ending 2001, their progeny, and the progeny of the previous decade's in-migrants. It can be seen that, by the decade ending 2021 under Scenarios A and C the in-migrants and their offspring would be expected to contribute about 99 percent of the total population increase, with the natural increase of the base year population contributing only about 1 percent. Shortly after 2021, under Scenarios A and C the base year population would actually be decreasing, and the in-migrants would be contributing more to population growth than the net increase. A similar situation is anticipated to start occurring shortly before 2011 under Scenarios B and D.

This emphasizes the extreme importance of in-migration assumptions in both scenarios under anticipated conditions of fertility and natural population increase during the next few decades. If economic conditions and social/political decisions are not such as to allow the approximate levels of annual net in-migration as shown in the last row of Exhibit 4, it would be unlikely that the rates of growth postulated in Scenarios A and C, or possibly even in Scenarios B and D, could be achieved.

This, in turn, leads to the need to emphasize the point made earlier in Section 1.1 of this report: that none of the GO ALRT scenarios is presented as a "most likely" growth forecast, but that each represents a possible development trend and together they reflect to some extent the range of uncertainty that exists in any estimates of the future. As stated earlier, Scenarios A and C have been postulated as a means of testing design requirements of the GO ALRT system under buoyant conditions of

population and economic growth, while Scenarios B and D provide a basis for testing operating requirements and financial implications for the system under more moderate growth conditions. As can be seen from the assumptions, factors and estimates of overall GTA growth discussed in this chapter, the range of uncertainty is certainly wider than represented by the two pairs of scenarios - growth could conceivably be higher than Scenarios A and C or lower than Scenarios B and D - and it may be appropriate to consider other sensitivity studies of GO ALRT ridership demand and financial characteristics to test the implications of such conditions. This is discussed further in the concluding chapter of the report. The range of overall GTA growth levels in population and employment defined by Scenarios A and C and Scenarios B and D is shown graphically in Exhibit 5.

EXHIBIT 5: G.T.A. TREND LINES: POPULATION AND EMPLOYMENT



3. GROWTH DISTRIBUTION AMONG REGIONAL MUNICIPALITIES

3.1 Factors Underlying Growth Distribution

As can be seen from the structure of this report, we have taken a "top down" approach in developing the two pairs of GO ALRT land use scenarios: dealing first with assumptions, factors and estimated growth levels at the overall GTA level in the first step, distributing this growth among the six regional municipalities in the second step, and distributing growth within each regional municipality to smaller zones in the third step. We feel that this is a logical approach, since the amount of growth available in the total GTA, its nature and the way in which it is generated, will influence very strongly the share of growth which can be achieved by each regional municipality and its sub-areas.

In considering growth distribution at the regional municipality level, we are dealing at a "macro" level which is influenced in part by different factors than the more "micro" scale of factors influencing distribution within smaller zones. In this section we deal with the macro distribution and Section 5, following, deals with the micro distribution. There is a "tidal wave of growth" theory which states that growth in an urban area tends to move out concentrically from the central area, with increasing development densities in inner areas as infill and redevelopment occur in response to increasing land prices. One branch of the theory also suggests that population densities at the centre tend to stabilize and then decrease with time, reflecting the greater ability of employment establishments to pay the high land prices and rents at the centre, in return for its more strategic location. It is recognized that an overall trend of this type tends to be distorted by factors such as major highways and transit lines (which tend to attract greater development owing to the higher accessibility offered), natural barriers such as lakes, rivers, valleys and hills, and land ownership patterns, particularly of major tracts, political jurisdictions and possible differing policies regarding development and development regulations, and land capacity constraints in terms of hard services and availability of new land for development.

There is strong evidence that such factors have been operating in the GTA. For example, during the 1961-1971 decade 55% of the total growth in GTA population over the decade occurred in Metro Toronto, while 17% occurred in Peel and less than 10% occurred in each of the other regional municipalities. Conversely, in the 1971-1981 decade Metro achieved only 9.5% of the growth, Peel achieved 46%, York 17% and Durham and Halton each about 13%. This illustrates the apparent "saturation" effect of population growth in Metro and the surge in Peel's growth during the 1970's as it received the lion's share of overspill from Metro owing to its strategic location between Metro Toronto and Hamilton/Burlington. York was also well situated to receive overspill in terms of its distance from downtown Toronto, but its growth was constrained during most of the 1970's until the York-Durham sewer system was installed. Durham and Halton were not quite so well situated to receive growth at that time because of their greater distance from the downtown core of the Area and less direct road/transit connections. Hamilton Wentworth also appeared to experience growth saturation effects in both decades, perhaps partially because of some servicing constraints, relatively slow growth in manufacturing employment, and possibly because of its even greater distance from the GTA core and physical development constraints due to the escarpment. While projected development by 2021 would exceed water/sewer capacities as now planned in a number of municipalities, there is no reason that these plans cannot be expanded over the longer term to meet growth requirements.

In developing growth distribution estimates among the six regional municipalities for future decades, we have generally assumed that the wave theory would continue to have its effect, with Peel showing strong growth until area saturation starts to take effect, York showing substantial growth now that sewer/water facilities are in place, and overspill from Metro and Peel occurring also in Durham, Halton and Hamilton-Wentworth, particularly in the latter decades of the planning period. Population in Metropolitan Toronto is anticipated to grow relatively slowly in Scenario A, somewhat more quickly in Scenario C, and more slowly in Scenarios B and D, reflecting the saturation effects referred to earlier.

The impact of the GO ALRT system itself is also assumed to be quite substantial. Rail transit extensions eastward to Oshawa and westward

to Hamilton by 1986/87 are anticipated to contribute to higher population growth in Durham and Hamilton-Wentworth, respectively, than would otherwise have occurred by 1991 and 2001, with an upward influence also on employment growth in those two regions, lagging the population growth by perhaps 5-10 years. Increased service on the Lakeshore Line is also anticipated to contribute to population growth in South Peel and South Halton and to employment growth in Metropolitan Toronto and Peel. The North Metro Line is anticipated to enhance the growth of population and employment in regional sub-centres such as North York, Scarborough Town Centre, North Etobicoke, Toronto International Airport and Mississauga City Centre, as service is extended to these centres. This Line is also expected to contribute to greater population and employment growth in the southern part of York Region.

Another set of considerations taken into account in the regional distributions is the various centralizing and decentralizing factors inherent in each scenario, as described in Chapter 2 of this report. Scenario A essentially reflects high population growth in the suburbs and high employment growth in downtown Toronto, with significant employment growth also in other regional centres and sub-centres. Scenario C reflects slightly more population growth in Metro and less in the other regions, while Scenarios B and D reflect substantially less decentralization of both population and employment, as well as lower growth overall.

Scenarios C and D were developed as a variation on Scenarios A and B, respectively, to provide a more consistent spread of population levels in the various regional municipalities between the high and low estimates for 2001, 2011 and 2021. The differences between Scenarios A and C are that the latter shows about 100,000 more people in Metro Toronto by 2021, about 11,000 more people in Peel, about 50,000 fewer people in each of York and Halton and small reductions in Durham and Hamilton-Wentworth. Similar changes are reflected in Scenario C for the intermediate years, 2001 and 2011, except that less population is shown in Peel, in favour of more in north Metro, under the impetus of the GO ALRT North Line. Scenario D differs from Scenario B by showing, for 2021, 85,000 fewer people in Peel, 50,000 more in Halton, 25,000 more in Metro and 10,000 more in York, and related changes for the years 2001 and 2011. With these changes, Scenarios C and D provide the basis for GO ALRT demand estimates which

would reflect a greater spread between the high and low population estimates for Metro in 2001, 2011 and 2021 and for Peel in 2021, less decentralization of population growth to the suburban municipalities in the high growth scenario, and greater balance in population growth rates among the various regional municipalities.

No changes were made in employment (between Scenarios A and C, and B and D, respectively) since the main purpose of developing Scenarios C and D was to test alternative impacts of the GO ALRT system on population distributions and any corresopnding impacts on employment would probably occur later and be less pronounced than impacts on population.

3.2 Estimated Regional Distributions

Exhibits 6 and 7 show, for Scenarios A and C and Scenarios B and D respectively, historical growth of population and employment by regional municipality in the decades from 1961 for population and from 1971 for employment (earlier employment data is not available on a consistent basis) and projections on the same format at 10 year intervals to 2021. Within the assumptions described in the previous paragraphs, the growth achieved in each decade by each regional municipality was estimated in a manner which showed relatively smooth variations over time while responding to the various growth factors.

For ease of comparison, the regional distributions are summarized in Exhibit 8 which shows both pairs of scenarios but omits the population and employment growth rates by decade.

Exhibit 9A shows in graphical form the trends of population by regional municipality under Scenario A and Scenario B while Exhibit 9B is a similar portrayal of Scenarios B and D. The "wave of growth" aspects referred to earlier can be clearly seen on Exhibit 9A, with high growth in Metro Toronto becoming relatively saturated following 1971; with Peel taking over the high growth role at that point until it is anticipated to become relatively saturated by about 2011; with York achieving relatively high rates of growth following 1981, Halton picking up in growth as Peel starts to saturate, Durham showing a steady growth trend, and Hamilton-Wentworth also showing a steady but lesser growth trend. Growth patterns

EXHIBIT 6

SCENARIOS A AND C: REGIONAL DISTRIBUTIONS

REGIONAL MUNICIPALITY	GO ALRT SCENARIO A (WITH SCENARIO C SHOWN IN PARENTHESIS WHERE DIFFERENT)												
	1961	61-71	1971	71-81	1981	81-91	1991	91-01	2001	01-11	2011	11-21	2021
POPULATION (000'S)													
DURHAM	152	65	217	67	284	74	358	72	430	70	500	85	585
								(92)	(450)	(50)		(80)	(580)
HALTON	107	83	190	64	254	46	300	98	398	76	474	136	610
								(80)	(380)	(98)	(478)	(82)	(560)
HAM.-WENT.	359	42	401	10	411	28	439	46	485	40	525	80	605
												(75)	(600)
METRO	1,621	469	2,090	47	2,137	43	2,180	35	2,215	32	2,247	27	2,274
								(60)	(2240)	(85)	(2325)	(50)	(2375)
PEEL	112	148	260	231	491	200	691	240	931	189	1,120	9	1,129
								(221)	(912)	(142)	(1054)	(86)	(1140)
YORK	114	52	166	86	252	142	394	144	538	138	676	126	802
								(136)	(530)	(130)	(660)	(90)	(750)
GTA TOTAL	2,465	859	3,324	505	3,829	533	4,362	635	4,997	545	5,542	463	6,005
EMPLOYMENT (000'S)													
DURHAM			71	19	90	23	113	27	140	42	180	31	211
HALTON			57	23	80	13	93	32	125	38	163	48	211
HAM.-WENT.			168	24	192	12	204	25	229	24	253	20	273
METRO			1,008	179	1,187	128	1,315	95	1,410	90	1,500	58	1,558
PEEL			105	132	237	105	342	120	462	88	550	40	590
YORK			48	57	105	73	178	57	235	47	282	47	329
GTA TOTAL			1,457	434	1,891	354	2,245	356	2,601	327	2,928	244	3,172

EXHIBIT 7

SCENARIOS B AND D: REGIONAL DISTRIBUTIONS

REGIONAL MUNICIPALITY	GO ALRT SCENARIO B (WITH SCENARIO D SHOWN IN PARENTHESES WHERE DIFFERENT)												
	1961	61-71	1971	71-81	1981	81-91	1991	91-01	2001	01-11	2011	11-21	2021
POPULATION (000'S)													
DURHAM	152	65	217	67	284	46	330	65	395	48 (65)	443 (460)	47 (30)	490
HALTON	107	83	190	64	254	26	280	45 (40)	325 (320)	30 (50)	355 (370)	45 (80)	400 (450)
HAM.-WENT.	359	42	401	10	411	14	425	20 (25)	445 (450)	15 (20)	460 (470)	23 (20)	490
METRO	1,621	469	2,090	47	2,137	3	2,140	10	2,150	15	2,165	10 (35)	2,175 (2200)
PEEL	112	148	260	231	491	131	622	184 (204)	806 (826)	172 (127)	978 (953)	132 (72)	1,110 (1025)
YORK	114	52	166	86	252	98	350	120 (100)	470 (450)	65 (75)	535 (525)	65 (85)	600 (610)
GTA TOTAL	2,465	859	3,324	505	3,829	318	4,147	444	4,591	352	4,943	322	5,265
EMPLOYMENT (000'S)													
DURHAM			71	19	90	10	100	12	122	20	142	15	157
HALTON			57	23	80	9	89	11	100	13	113	17	130
HAM.-WENT.			168	24	192	10	202	12	214	12	226	14	240
METRO			1,008	179	1,187	57	1,244	84	1,328	32	1,360	25	1,385
PEEL			105	132	237	54	291	79	370	60	430	45	475
YORK			48	57	105	42	147	29	176	20	196	20	216
GTA TOTAL			1,457	434	1,891	182	2,073	227	2,310	157	2,467	136	2,603

EXHIBIT 8

SUMMARY OF REGIONAL DISTRIBUTIONS

REGIONAL MUNICIPALITY				GO SCENARIO A (AND C)				GO SCENARIO B (AND D)			
	1961	1971	1981	1991	2001	2011	2021	1991	2001	2011	2021
POPULATION (000'S)											
DURHAM	152	217	284	358	430 (450)	500	585 (580)	330	395	443	490
HALTON	107	190	254	300	398 (380)	474 (478)	610 (560)	280	325 (320)	355 (370)	400 (450)
HAMILTON-WENTWORTH	359	401	411	439	485	525	605 (600)	425	445 (450)	467 (470)	490
METRO	1,621	2,090	2,137	2,180	2,215 (2240)	2,247 (2325)	2,274 (2375)	2,140	2,150	2,165	2,175 (2200)
PEEL	112	260	491	691	931 (912)	1,120 (1054)	1,129 (1140)	622	806 (826)	978 (953)	1,110 (1025)
YORK	114	166	252	394	538 (530)	676 (660)	802 (750)	350	470 (450)	535 (525)	600 (610)
GTA TOTAL	2,465	3,324	3,829	4,362	4,997	5,542	6,005	4,147	4,591	4,943	5,265
EMPLOYMENT (000'S)											
DURHAM		71	90	113	140	180	211	100	122	142	157
HALTON		57	80	93	125	163	211	89	100	113	130
HAMILTON-WENTWORTH		168	192	204	229	253	273	202	214	226	240
METRO		1,008	1,187	1,315	1,410	1,500	1,558	1,244	1,328	1,360	1,385
PEEL		105	237	342	462	550	590	291	370	430	475
YORK		48	105	178	235	282	329	147	176	196	216
GTA TOTAL		1,457	1,891	2,245	2,601	2,928	3,172	2,073	2,310	2,467	2,603

* Scenarios C and D are shown in parentheses where they differ from Scenarios A and B, respectively

EXHIBIT 9A: REGIONAL POPULATION TREND LINES - SCENARIOS A & B

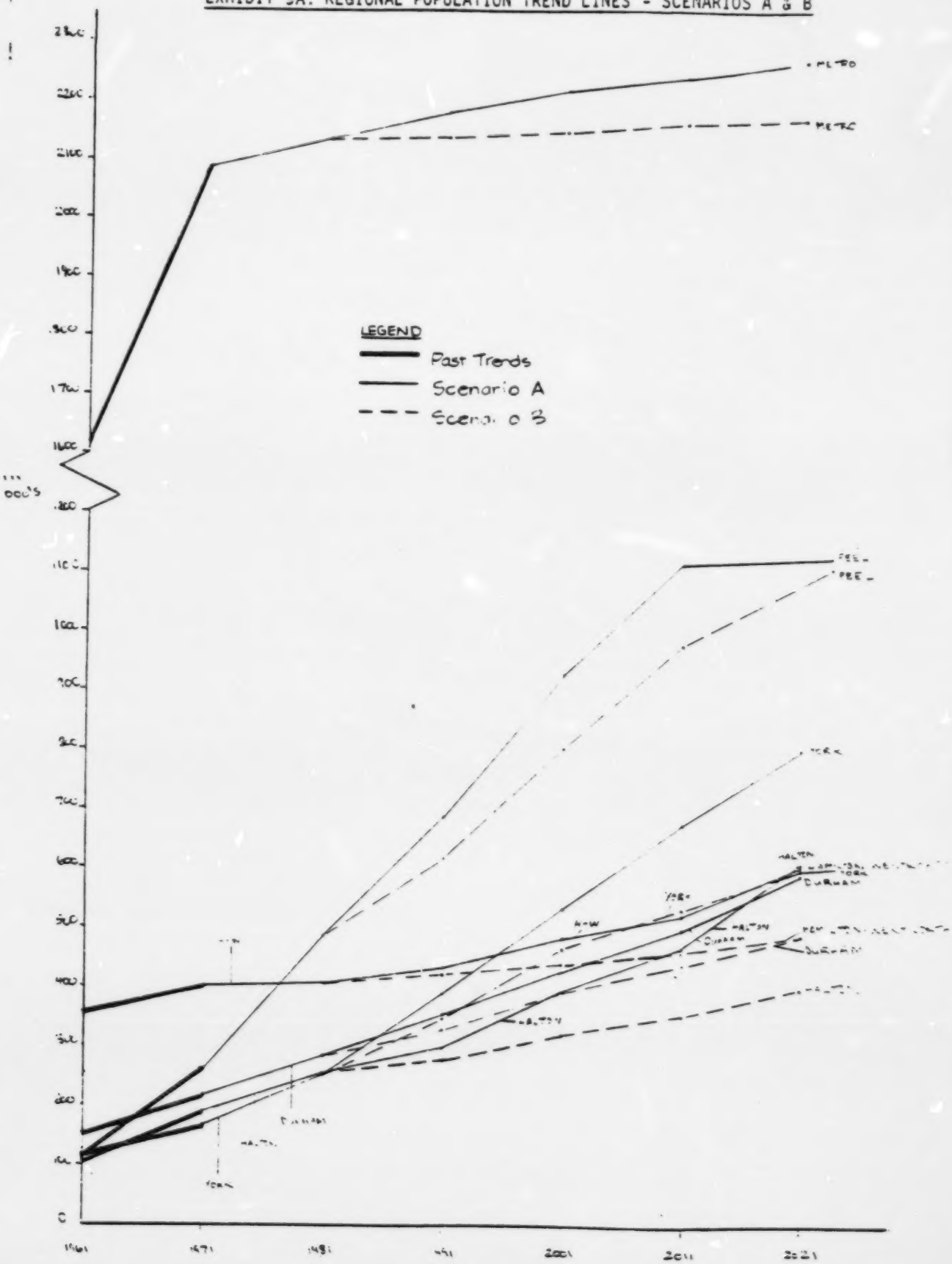
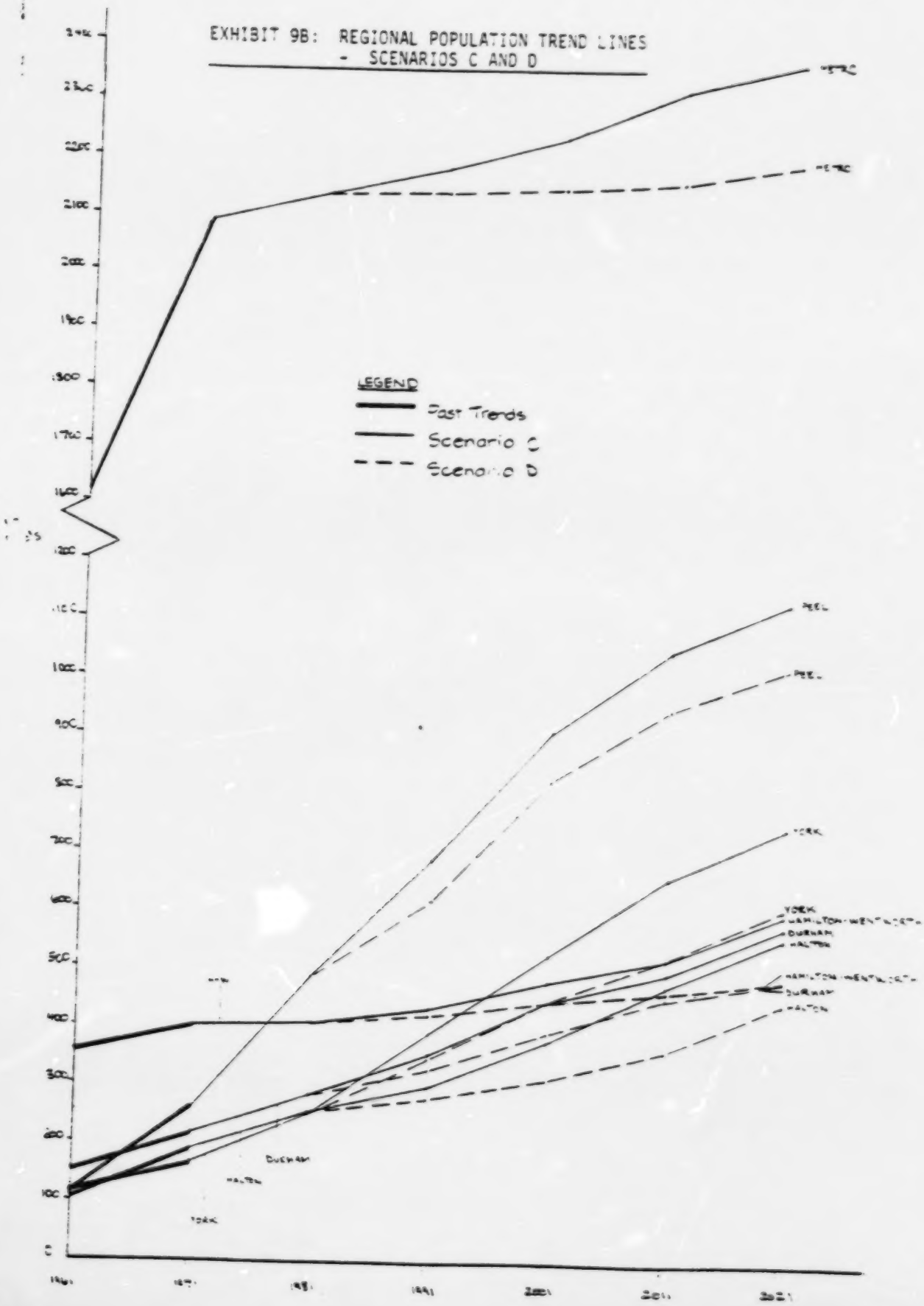


EXHIBIT 9B: REGIONAL POPULATION TREND LINES
- SCENARIOS C AND D



are similar for Scenario A and Scenario B although, naturally, saturation effects take place later in Peel under Scenario B, and growth levels are lower in all regional municipalities under that scenario.

Exhibit 9B shows the greater balance of population growth among the regional municipalities, stronger growth in Metro Toronto and a greater high-low spread in Metro and Peel by 2021, as noted earlier. Scenarios C and D, as illustrated, embody the assumption that the GO ALRT system would tend to spread population growth more evenly among the regional municipalities with less concentration of growth in Peel.

Exhibit 10 provides a similar graphic portrayal of growth trends and projections of employment by regional municipality for the two pairs of scenarios. The continued rapid growth of employment in Metropolitan Toronto assumed for Scenarios A and C shows clearly in this exhibit, reflecting the assumed continuing strong and expanding role of downtown Toronto as the national financial/head office centre of Canada and the overall enhancement of employment growth within Metro owing to the greater accessibility to both south and north Metro from most parts of the GTA provided by the GO ALRT system. Relatively strong growth of employment is also shown for the other regional municipalities under Scenarios A and C, particularly Peel and York. All six regional municipalities are shown to have substantially lower rates of employment growth in Scenarios B and D, with a degree of saturation showing in Metropolitan Toronto following the turn of the century. The slower rate of growth in employment for most regional municipalities under Scenarios B and D from 1981 to 1991 reflects the assumption that recovery from the current economic recession will be slow under that pair of scenarios.

3.3 Other Descriptors of Regional Distributions

Exhibit 11 shows in tabular form the share of the GTA population and employment, respectively, located within Metropolitan Toronto, historically for the years 1961, 1971 and 1981 where available and as projected for the years 1991, 2001, 2011 and 2021 under Scenario A and Scenario B. The general downward trend of Metro Toronto's share is shown historically, declining from 66% in 1961 to 56% in 1981 for population and from 69% in

EXHIBIT 10: REGIONAL EMPLOYMENT TREND LINES: ALL SCENARIOS

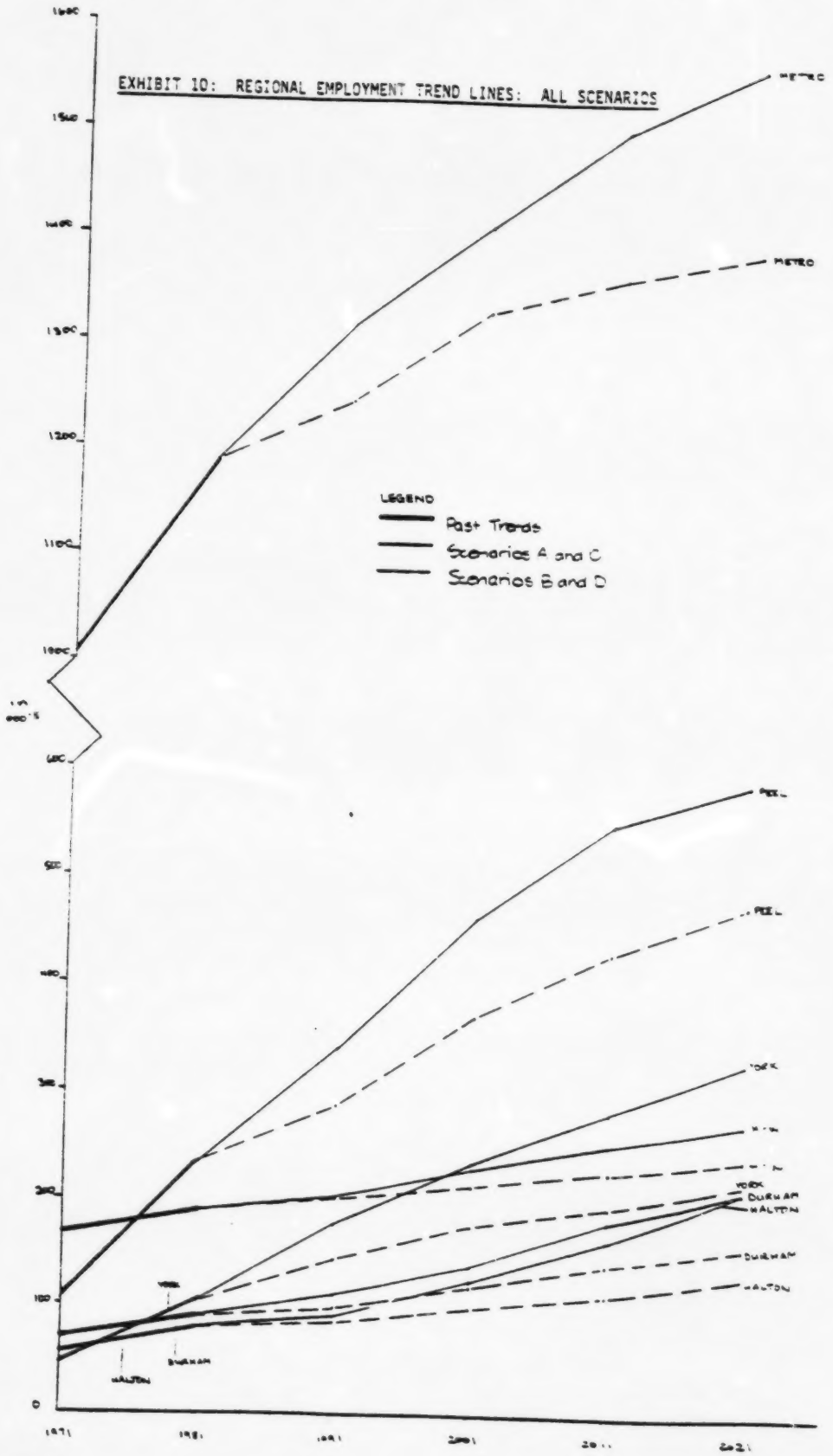


EXHIBIT 11

METROPOLITAN TORONTO'S SHARE OF TOTAL GTA (%)

				GO SCENARIO A (AND C)*				GO SCENARIO B (AND D)*			
	1961	1971	1981	1991	2001	2011	2021	1991	2001	2011	2021
POPULATION	65.8	62.9	55.8	50.0	44.3 (44.8)	40.5 (42.0)	37.9 (39.6)	51.6	46.8	43.8	41.3 (41.8)
EMPLOYMENT		69.2	62.8	58.6	54.2	51.2	49.1	60.0	57.5	55.1	53.2

* Scenarios C and D are shown in parentheses where they differ from Scenarios A and B, respectively

1971 to 63% in 1981 for employment. As shown earlier, this does not mean that there has been a drop in the absolute level of either population or employment within Metropolitan Toronto, but rather that relatively more growth has occurred elsewhere as new lands were opened up in the surrounding regional municipalities and as growth tended to saturate within Metro Toronto, particularly for population.

The downward trend is shown as continuing under both Scenario A and Scenario B, with Metro's share of population dropping from 50% to 38% between 1991 and 2021 under Scenario A and its share of population dropping from 52% to 41% over the same period under Scenario B. Metro's share of employment is estimated to drop from 59% in 1991 to 49% in 2021 under Scenario A and from 60% to 53% over the same period under Scenario B. The slightly greater decentralization of both people and jobs under Scenario A reflects the assumptions and factors discussed in Section 2 and in subsection 3.1 above. The decline in Metro's share of population is less under Scenario C than under Scenario A reflecting the stronger population growth in Metro assumed under Scenario C, and the same is true under Scenario D (relative to Scenario B) for the decade ending in 2021.

Another variable which is useful in analyzing development patterns and travel behaviour is the ratio of employment (jobs) divided by population, also known as the activity ratio. Historical levels of activity ratios for each of the six regional municipalities and for the entire GTA are shown in Exhibit 12 for 1971 and 1981 and projected values are shown in the same exhibit for each of the four scenarios.

For the GTA as a whole, these values are very similar to the participation rates shown in Exhibit 4 and discussed in Section 2.3. There are some significant differences among the regional municipalities, however, which warrant some discussion.

For Scenario A, the pronounced upward trend of the employment/population ratio for Metropolitan Toronto, from 60.3% in 1991 to 68.5% in 2021 stands out; this reflects the continuing strong decentralization of population growth and substantial growth of employment within Metropolitan Toronto under this scenario, as discussed earlier. Trends anticipated for

EXHIBIT 12

EMPLOYMENT/POPULATION RATIOS (%)

REGIONAL MUNICIPALITY			GO ALRT SCENARIO A (AND C)*				GO ALRT SCENARIO B (AND D)*			
	1971	1981	1991	2001	2011	2021	1991	2001	2011	2021
DURHAM	32.7	31.7	31.6	32.6 (31.1)	36.0	36.1 (36.4)	30.3	30.9 (31.3)	32.0 (30.9)	32.0
HALTON	30.0	31.5	31.0	31.4 (32.9)	34.4 (34.1)	34.6 (37.7)	31.8	30.8	31.8 (30.5)	32.5 (28.9)
HAMILTON-WENTWORTH	41.9	46.7	46.5	47.2	48.2	45.1 (45.5)	47.5	48.1 (47.6)	48.4 (48.1)	49.0
METRO	48.2	55.5	60.3	63.7 (62.9)	66.8 (64.5)	68.5 (65.6)	58.1	61.8	62.8	63.7 (63.0)
PEEL	40.4	48.3	49.5	49.6 (50.7)	49.1 (52.2)	52.3 (51.8)	46.8	45.9 (44.8)	44.0 (45.1)	42.8 (46.3)
YORK	28.9	41.7	45.2	43.7 (44.3)	41.7 (42.7)	41.0 (43.9)	42.0	37.4 (39.1)	36.6 (37.3)	36.0 (35.4)
GTA TOTAL	43.8	49.4	51.5	52.0	52.8	52.8	50.0	50.3	50.0	49.6

* Scenarios C and D are shown in parentheses where they differ from Scenarios A and B, respectively

the other regional municipalities reflect their varying stages of development, the impact of the "wave" of population growth at various times, saturation of population growth anticipated by 2021 in Peel under Scenario A, and the expectation that population growth would precede employment growth under the stimulus of GO ALRT, particularly in Durham and Halton. The activity ratio under this scenario would be relatively constant at about 49% for Peel throughout most of the forecast interval, with an increase to 52% during the last decade owing to the estimated saturation of population growth at that time. There would be a generally declining trend in the ratio for York, reflecting its particularly strong population growth under this scenario. Hamilton-Wentworth would experience a steady increase in activity ratio until 2011, followed by an anticipated drop in the last decade owing to increased population growth as an overspill from Peel. Halton would show a somewhat similar trend to Hamilton-Wentworth in this regard, while the activity ratio for Durham would increase substantially during the latter two decades reflecting the anticipated delayed employment stimulus of the GO ALRT system.

Similar, although less pronounced trends would be anticipated for Durham, Halton, Metro, Peel and York under the B Scenario. The upward trend in activity ratio for Hamilton-Wentworth would, however, continue through 2021 under this scenario, reflecting the lack of a population surge during the last decade of the planning period and the expectation that employment growth would be moderately strong throughout the period because of the well established industrial concentration and central business district in the City of Hamilton.

As shown in parentheses in Exhibit 12, the trends of employment/population ratios under Scenarios C and D would be quite similar to those for Scenarios A and B except that the ratios would be generally higher in Peel and York and lower in Metro under Scenario C than under Scenario A. The other most noteable change would be a higher ratio in Halton under Scenario C (relative to Scenario A) in 2021, a lower ratio in Halton under Scenario D (relative to Scenario B) in the same year, and higher ratios by 2011 and 2021 in Peel under Scenario D. These differences reflect the population shifts discussed earlier.

These trends would be expected to have an impact on the length and orientation of inter-regional work trips, as discussed further in Section 5.1 below. Similarly, the regional municipalities outside of Metro Toronto would be more self-contained (in terms of having higher employment/population ratios) under Scenario C than under Scenario A, which is more in line with their planning goals and would tend to produce somewhat lower levels of inter-regional commuting than would occur under Scenario A.

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4. GROWTH DISTRIBUTION AT THE 50 ZONE LEVEL

4.1 Factors Underlying Growth Distribution

A map of the 50 zone system used for a more detailed distribution of population and employment under each scenario is presented in Exhibit 13. As can be seen, most of the zones at this level are area municipalities, with the exception that the three largest municipalities are further subdivided: Metropolitan Toronto into its 16 planning districts; the City of Mississauga into Mississauga North (lying north of Highway 401), Mississauga Middle (lying between Highway 401 and the Queen Elizabeth Way), and Mississauga South (lying south of the Queen Elizabeth Way); Hamilton Lower City (that part of the city lying north of the escarpment); and Hamilton Mountain (that part of the city south of the escarpment). In addition, Planning District 13 within Metropolitan Toronto is divided along Lawrence Avenue into a north section and a south section in order to resolve more explicitly the nature of its interaction with the Lakeshore and North Metro GO ALRT lines.

As discussed earlier in Section 3.1, while the same general factors affecting distribution at the regional municipality level will also affect distribution at the 50 zone level, there are a number of additional factors which must be taken into account at the more detailed level of analysis. These include more local impacts of the GO ALRT lines and stations, and factors such as nodal concentrations of population and employment, densities of new residential develoment, and the extent of ex-urban development anticipated in each scenario, as discussed earlier in Section 2.3 and Section 3.1. Also important at this more detailed level are land use zoning, land and servicing constraints, and the interaction of population and employment development momentum in adjacent zones. "Maximum" levels of population and employment, as shown in various Official Plans were used as guidelines regarding possible growth saturation levels but were not used as limits, recognizing that most Official Plans to date have been developed for 2001 while the GO ALRT scenarios project growth for another 20 years to 2021.

Because of the importance of local knowledge in developing these estimates, they were generally prepared on a cooperative basis with

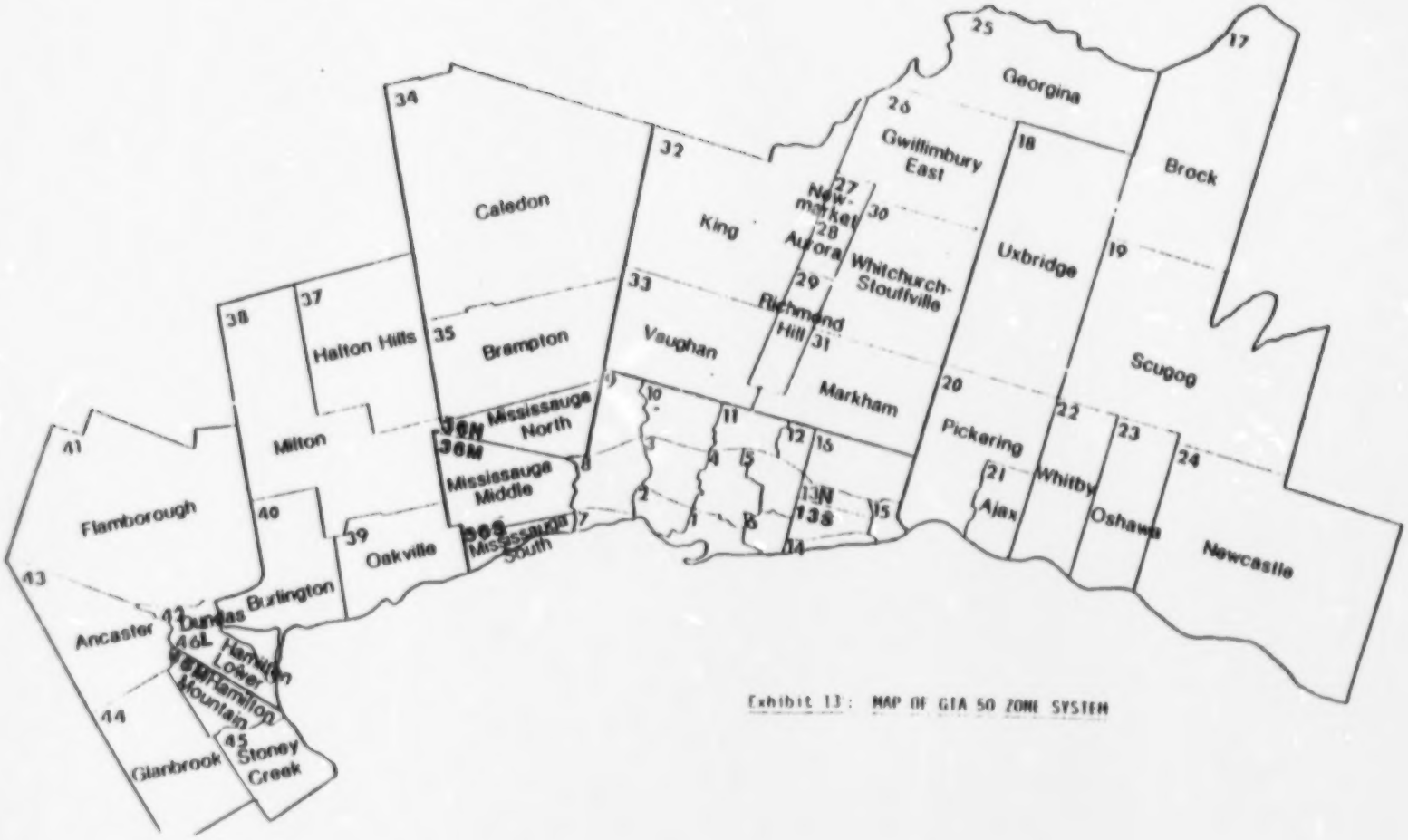

Exhibit 13: MAP OF GTA 50 ZONE SYSTEM

substantial consultation between the consultant and planning staff in each regional municipality. In one or two instances there were also discussions with planning staff of area municipalities. In all cases, there was a discussion of the underlying assumptions, followed by development of an initial distribution based on these, followed by further discussion and a number of resulting modifications in many cases.

4.2 Estimated Zonal Distributions

Population estimates at the 50 zone level are presented for Scenarios A and B in Exhibit 14A for Scenarios C and D in Exhibit 14B and employment estimates at the same level are presented in Exhibit 15. A few comments on highlights of these estimates are presented below.

Metropolitan Toronto

Population growth is relatively restrained under Scenarios A and B; this is distributed fairly evenly among the 17 analysis zones, with some differential growth to Planning District 1 (downtown Toronto), Planning District 11 (central North York), Planning District 13 South (southwest Scarborough), Planning District 15 (southeast Scarborough) and Planning District 16 (north Scarborough). Planning Districts 3, 4 and 5 (the south part of the Borough of North York and north parts of the Boroughs of York, East York and the City of Toronto) are also anticipated to have slightly higher than average growth rates under this scenario. Similar population distributions, although less pronounced, are shown for Scenario B. Scenarios C and D distribute the additional population growth (relative to Scenarios A and B, respectively) among the five planning districts north of Highway 401, reflecting impacts of the GO ALRT North Line.

Differential growth rates are more pronounced in the employment estimates, with strong growth in Planning District 1 under both pairs of scenarios and strong growth also in central North York, central West Scarborough, Southwest Scarbourgh, East Scarborough and North Scarborough.

EXHIBIT 14A: POPULATION ESTIMATES AT THE 50 ZONE LEVEL SCENARIOS A AND B ('000's)

ZONE	1981	GO ALRT SCENARIO A				GO ALRT SCENARIO B			
		1991	2001	2011	2021	1991	2001	2011	2021
PD 1	119.6	136.0	138.9	141.7	144.1	127.6	129.0	133.0	135.0
2	200.7	193.5	196.0	198.3	200.3	192.0	193.0	193.0	193.5
3	221.6	217.0	219.4	221.5	223.4	215.5	217.0	217.0	217.0
4	187.5	186.0	188.9	191.8	193.8	185.0	186.0	186.0	186.0
5	111.1	113.0	115.0	116.7	118.3	112.2	113.0	113.0	112.0
6	199.8	200.0	201.6	203.0	203.9	199.0	200.0	200.0	200.0
7	50.4	52.5	53.4	54.2	54.8	48.7	49.0	51.0	52.5
8	179.8	177.5	178.6	179.5	180.0	176.2	176.4	176.5	177.5
9	69.7	70.0	70.0	70.1	70.2	68.5	69.5	69.7	70.0
10	148.0	141.5	142.5	143.2	143.9	140.0	140.0	140.7	141.0
11	134.3	141.0	145.3	149.3	152.8	139.3	139.4	143.9	145.9
12	80.9	81.5	81.8	82.2	82.5	81.0	81.1	81.1	81.5
13 North	75.1	75.2	75.4	75.6	75.8	75.1	75.1	75.1	75.2
13 South	112.0	112.8	115.0	116.6	118.1	110.9	110.9	111.0	112.3
14	58.0	61.0	62.0	62.9	63.7	60.5	60.8	61.0	61.0
15	54.3	65.0	67.1	69.0	70.3	61.5	61.5	62.5	63.1
16	134.2	156.5	164.1	171.4	178.1	147.0	148.3	150.5	151.5
METRO TOTAL	2,137	2,180	2,215	2,247	2,274	2,140	2,150	2,165	2,175
Brock	9.3	9.9	11.9	13.8	16.1	9.8	11.7	13.1	14.5
Uxbridge	11.2	11.5	13.8	16.1	18.8	11.4	13.7	15.4	16.9
Scugog	13.5	15.7	17.8	20.0	22.7	15.7	17.7	19.6	21.3
Pickering	37.8	55.8	67.0	77.9	91.1	50.0	59.9	67.1	74.3
Ajax	25.5	34.4	41.3	48.1	56.2	33.0	39.5	44.3	49.0
Whitby	36.7	49.9	61.0	71.6	84.5	45.0	55.0	62.0	69.0
Oshawa	117.5	145.0	174.2	202.5	237.0	132.0	158.0	177.2	196.0
Newcastle	32.2	35.8	43.0	50.0	58.6	33.0	39.5	44.3	49.0
DURHAM TOTAL	284	358	430	500	585	330	395	443	490
Georgina	20.2	28.0	36.0	39.0	42.0	23.0	28.0	33.0	36.0
East Gwillimbury	12.6	16.0	20.0	21.0	23.0	15.0	18.0	20.0	21.0
Newmarket	29.8	37.0	42.0	48.0	52.0	35.0	39.0	42.0	45.5
Aurora	16.3	23.0	29.0	35.0	40.0	19.0	25.0	29.0	32.5
Richmond Hill	37.8	60.0	104.5	132.0	170.0	54.0	89.0	104.5	118.0
Whit. - Stouff.	13.6	16.0	20.0	21.0	23.0	15.0	17.0	20.0	21.0
Markham	77.0	110.0	134.0	189.0	224.0	102.0	125.0	134.5	159.0
King	15.2	19.0	22.0	23.0	25.0	18.0	20.0	22.0	23.0
Vaughan	29.7	85.0	130.5	168.0	203.0	69.0	109.0	130.5	144.0
YORK TOTAL	252	394	538	676	802	350	470	535	600
Caledon	25.6	31.0	37.0	42.0	47.0	30.0	31.5	34.1	38.3
Brampton	149.0	218.0	295.0	344.0	344.0	202.0	251.4	300.2	341.0
Mississauga N	34.4	34.5	34.6	34.7	34.7	34.4	34.4	34.5	34.5
Mississauga M	206.2	332.9	489.7	624.5	628.5	281.1	414.2	534.6	621.6
Mississauga S	74.5	74.6	74.7	74.8	74.8	74.5	74.5	74.6	74.6
PEEL TOTAL	491	691	931	1,120	1,129	622	806	978	1,110
Halton Hills	35.2	38.0	50.0	52.0	54.4	37.0	42.2	46.1	53.5
Milton	28.1	32.0	37.0	37.9	38.7	30.0	37.0	37.0	37.0
Oakville	75.8	106.0	141.0	199.0	296.9	93.0	109.4	120.9	141.0
Burlington	114.9	124.0	170.0	185.1	220.0	120.0	136.4	151.0	168.5
HALTON TOTAL	254	300	398	474	610	280	325	355	400
Flamborough	24.2	27.5	30.0	33.0	38.0	28.0	29.5	30.5	32.0
Dundas	19.6	21.0	22.0	24.0	27.5	21.0	22.0	24.0	26.0
Ancaster	14.6	20.0	30.0	38.0	49.0	20.0	29.5	31.0	34.0
Glanbrook	9.7	9.5	10.0	11.0	13.1	9.0	9.0	9.5	10.0
Stoney Creek	36.6	40.0	60.0	65.0	80.0	45.0	53.0	60.0	64.0
Hamilton (Lower)	195.0	186.0	191.0	202.0	210.9	183.0	171.2	178.0	184.0
Hamilton (Mount)	111.0	135.0	142.0	152.0	186.5	119.0	130.8	134.0	140.0
HAM. WENT. TOTAL	411	439	485	525	605	425	445	467	490
Metro	2,137	2,180	2,215	2,247	2,274	2,140	2,150	2,165	2,175
Durham	284	358	430	500	585	330	395	443	490
York	252	394	538	676	802	350	470	535	600
Peel	491	691	931	1,120	1,129	622	806	978	1,110
Halton	254	300	398	474	610	280	325	355	400
Ham. Wentworth	411	439	485	525	605	425	445	467	490
GTA TOTAL	3,829	4,362	4,997	5,542	6,005	4,147	4,591	4,943	5,265

EXHIBIT 14B: POPULATION ESTIMATES AT THE 50 ZONE LEVEL: SCENARIOS C AND D (occ 5)

ZONE	1981	GO ALRT SCENARIO C				GO ALRT SCENARIO D			
		1991	2001	2011	2021	1991	2001	2011	2021
PD 1	119.6	136.0	138.9	141.7	144.1	127.6	129.0	133.0	135.0
2	200.7	193.5	196.0	198.3	200.3	192.0	193.0	193.0	193.5
3	221.6	217.0	219.4	221.5	223.4	215.5	217.0	217.0	217.0
4	187.5	186.0	188.9	191.8	193.8	185.0	186.0	186.0	186.0
5	111.1	113.0	115.0	116.7	118.3	112.2	113.0	113.0	112.0
6	199.8	200.0	201.6	203.0	203.9	199.0	200.0	200.0	200.0
7	50.4	52.5	53.4	54.2	54.8	48.7	49.0	51.0	52.5
8	179.8	177.5	178.6	179.5	180.0	176.2	176.4	176.5	177.5
9	69.7	70.0	75.0	85.7	90.4	68.5	69.5	69.7	75.0
10	148.0	141.5	147.5	158.8	164.1	140.0	140.0	140.7	146.0
11	134.3	141.0	150.3	164.9	173.0	139.3	139.4	143.9	150.9
12	80.9	81.5	86.8	97.8	102.7	81.0	81.1	81.1	86.5
13 North	75.1	75.2	75.4	75.6	75.8	75.1	75.1	75.1	75.2
13 South	112.0	112.8	115.0	116.6	118.1	110.9	110.9	111.0	112.3
14	58.0	61.0	62.0	62.9	63.7	60.5	60.8	61.0	61.0
15	54.3	65.0	67.1	69.0	70.3	61.5	61.5	62.5	63.1
16	134.2	156.5	169.1	187.0	198.3	147.0	148.3	150.5	156.5
METRO TOTAL	2,137	2,180	2,240	2,325	2,375	2,140	2,150	2,165	2,200
Brock	9.3	9.9	11.9	13.8	16.1	9.8	11.7	13.1	14.5
Uxbridge	11.2	11.5	13.8	16.1	18.8	11.4	13.7	15.4	16.9
Scugog	13.5	15.7	17.8	20.0	22.7	15.7	17.7	19.6	21.3
Pickering	37.8	55.8	71.2	77.9	90.1	50.0	59.9	70.1	74.3
Ajax	25.5	34.4	46.3	48.1	55.2	33.0	39.5	47.3	49.0
Whitby	36.7	49.9	66.0	71.6	83.5	45.0	55.0	66.0	69.0
Oshawa	117.5	145.0	180.0	202.5	235.0	132.0	158.0	184.2	196.0
Newcastle	32.2	35.8	43.0	50.0	58.6	33.0	39.5	44.3	49.0
DURHAM TOTAL	284	358	450	500	580	330	395	460	490
Georgina	20.2	28.0	36.0	39.0	40.0	23.0	28.0	33.0	36.0
East Gwillimbury	12.6	16.0	20.0	21.0	21.5	15.0	18.0	20.0	21.0
Newmarket	29.8	37.0	42.0	48.0	49.5	35.0	39.0	42.0	45.5
Aurora	16.3	23.0	29.0	35.0	36.5	19.0	25.0	29.0	32.5
Richmond Hill	37.8	60.0	101.5	127.0	159.0	54.0	84.0	102.5	121.0
Whit. - Stouff.	13.6	16.0	20.0	21.0	21.5	15.0	17.0	20.0	21.0
Markham	77.0	110.0	131.0	183.0	209.2	102.0	117.0	130.5	163.0
King	15.2	19.0	22.0	23.0	23.0	18.0	20.0	22.0	23.0
Vaughan	29.7	85.0	128.5	163.0	189.8	69.0	102.0	126.5	147.0
YORK TOTAL	252	394	530	660	750	350	450	525	610
Caledon	26.6	31.0	37.0	39.0	47.0	30.0	31.8	33.6	35.0
Brampton	149.0	218.0	284.7	321.5	350.0	202.0	259.3	290.2	319.0
Mississauga N	34.4	34.5	34.6	34.7	34.7	34.4	34.4	34.5	34.5
Mississauga M	206.2	332.9	481.0	584.0	633.5	281.1	426.0	520.1	565.9
Mississauga S	74.5	74.6	74.7	74.8	74.8	74.5	74.5	74.6	74.6
PEEL TOTAL	491	691	912	1,054	1,140	622	826	953	1,029
Halton Hills	35.2	38.0	47.8	52.0	53.3	37.0	42.2	48.1	55.0
Milton	28.1	32.0	35.5	37.9	38.7	30.0	34.0	37.0	37.0
Oakville	75.8	106.0	134.7	201.0	263.0	93.0	108.4	126.9	183.0
Burlington	114.9	124.0	162.0	187.1	205.0	120.0	135.4	158.0	175.0
HALTON TOTAL	254	300	380	478	560	280	320	370	450
Flamborough	24.2	27.5	30.0	33.0	38.0	28.0	29.5	30.5	32.0
Dundas	19.6	21.0	22.0	24.0	27.5	21.0	22.0	24.0	26.0
Ancaster	14.6	20.0	30.0	38.0	49.0	20.0	29.5	31.0	34.0
Glanbrook	9.7	9.5	10.0	11.0	13.1	9.0	9.0	9.5	10.0
Stoney Creek	36.6	40.0	60.0	65.0	80.0	45.0	53.0	60.0	64.0
Hamilton (Lower)	195.0	186.0	191.0	202.0	208.4	183.0	174.2	180.0	184.0
Hamilton (Mount)	111.0	135.0	142.0	152.0	184.0	119.0	132.8	135.0	140.0
HAM. WENT. TOTAL	411	439	485	525	600	425	450	470	490
Metro	2,137	2,180	2,240	2,325	2,375	2,140	2,150	2,165	2,200
Durham	284	358	450	500	580	330	395	443	490
York	252	394	530	660	750	350	470	535	610
Peel	491	691	912	1054	1,140	622	806	978	1,025
Halton	254	300	380	478	560	280	325	355	450
Ham. Wentworth	411	439	485	525	600	425	445	467	490
GTA TOTAL	3,829	4,362	4,997	5,542	6,005	4,147	4,591	4,943	5,265

EXHIBIT 15: EMPLOYMENT ESTIMATES AT THE 50 ZONE LEVEL (cont'd)

ZONE	1981	GO ALRT SCENARIOS A AND C				GO ALRT SCENARIOS B AND D			
		1991	2001	2011	2021	1991	2001	2011	2021
PD 1	360.6	395.9	424.5	445.0	460.0	373.0	409.0	420.0	428.0
2	48.4	51.1	53.5	55.0	57.0	49.0	50.0	51.0	51.0
3	95.1	101.7	107.0	110.0	111.0	97.0	101.0	102.0	103.0
4	90.0	100.5	106.0	112.0	115.0	100.0	102.0	103.0	104.0
5	65.4	78.8	83.8	87.0	89.0	74.0	78.0	80.0	81.0
6	39.7	42.0	44.0	45.0	46.0	40.0	41.0	41.0	42.0
7	30.8	34.8	38.3	42.0	44.0	32.0	35.0	36.0	38.0
8	67.0	71.0	74.2	77.0	78.0	68.0	69.0	70.0	71.0
9	56.1	61.0	63.5	66.0	67.0	58.0	60.0	62.0	63.0
10	133.0	138.9	141.3	143.0	144.0	134.0	135.0	136.0	137.0
11	33.3	42.8	50.2	70.0	80.0	39.0	48.0	51.0	54.0
12	32.0	33.0	34.0	36.0	38.0	32.0	33.0	33.0	33.0
13 North	49.4	62.3	72.2	83.1	93.0	57.0	68.0	72.0	74.0
13 South	42.9	48.5	50.0	51.0	52.0	44.0	46.0	47.0	48.0
14	6.1	6.9	8.0	9.0	9.0	6.0	7.0	7.0	7.0
15	8.0	9.5	12.5	14.0	16.0	8.0	9.0	10.0	10.0
16	29.5	36.3	47.0	55.0	59.0	33.0	37.0	39.0	41.0
METRO TOTAL	1,187	1,315	1,410	1,500	1,558	1,244	1,328	1,360	1,385
Brock	2.6	2.8	3.4	4.4	5.1	2.5	3.1	3.6	3.9
Uxbridge	2.5	2.7	3.3	4.2	5.0	2.5	3.1	3.6	3.9
Scugog	2.6	2.9	3.6	4.6	5.4	3.0	3.6	4.2	4.7
Pickering	9.1	15.1	18.7	24.1	28.3	10.5	12.8	14.9	16.5
Ajax	12.7	17.0	21.1	27.2	31.8	11.0	13.4	15.6	17.3
Whitby	10.3	13.1	16.3	20.9	24.5	12.0	14.6	17.0	18.8
Oshawa	43.4	51.2	63.5	81.6	95.6	50.0	61.0	71.0	78.5
Newcastle	6.9	8.2	10.1	13.0	15.3	8.5	10.4	12.0	13.4
DURHAM TOTAL	90	113	140	180	211	100	122	142	157
Georgina	3.3	5.2	7.0	7.7	8.5	4.2	5.0	6.0	7.0
East Gwillimbury	1.5	2.8	4.0	4.8	5.5	2.1	2.7	3.4	4.0
Newmarket	10.3	15.2	20.0	21.5	23.0	12.6	15.0	16.9	19.0
Aurora	5.7	9.9	14.0	15.0	16.0	7.7	9.9	11.4	13.0
Richmond Hill	13.0	29.0	45.0	54.0	63.0	22.3	28.5	33.8	38.0
Whit. - Stouff.	4.0	4.7	5.3	6.0	7.0	4.4	4.7	5.4	6.0
Markham	38.3	63.4	73.0	92.0	112.0	53.2	63.0	66.0	70.0
King	2.9	3.8	4.7	5.0	6.0	3.3	3.7	4.4	5.0
Vaughan	26.0	44.0	62.0	76.0	88.0	37.2	43.5	48.7	54.0
YORK TOTAL	105	178	235	282	329	147	176	196	216
Caledon	5.0	7.0	9.0	10.0	10.0	6.0	7.0	8.0	8.0
Brampton	60.0	99.0	138.0	170.0	170.0	84.1	110.6	132.1	138.8
Mississauga N	49.5	81.5	111.9	126.9	141.7	62.3	80.6	94.6	109.2
Mississauga M	95.5	127.5	176.1	216.1	241.3	111.6	145.0	168.5	192.3
Mississauga S	27.0	27.0	27.0	27.0	27.0	27.0	26.8	26.8	26.7
PEEL TOTAL	237	342	462	550	590	291	370	430	475
Halton Hills *	7.5	8.1	9.7	10.4	11.7	7.8	8.9	9.8	11.3
Milton *	5.6	6.4	6.8	7.4	8.1	6.0	6.4	6.7	7.1
Oakville *	33.3	43.0	57.6	74.0	100.5	40.9	45.7	52.4	61.9
Burlington *	33.6	35.5	50.9	71.2	90.7	34.3	39.0	44.1	49.7
HALTON TOTAL	80	93	125	163	211	89	100	113	130
Flamborough		5.0	7.0	9.0	11.0	4.5	6.0	7.0	8.0
Dundas		5.5	7.0	8.0	9.0	5.5	6.0	6.0	7.0
Ancaster	Not	4.0	8.0	11.0	15.0	4.0	7.0	9.0	11.0
Glanbrook	Avail-	3.0	5.0	6.0	7.0	3.0	3.0	4.0	5.0
Stoney Creek	able	16.0	22.0	28.0	32.0	16.0	20.0	23.0	26.0
Hamilton (Lower)		144.5	150.0	158.0	163.0	143.0	145.0	148.0	152.0
Hamilton (Mount)		26.0	30.0	33.0	36.0	26.0	27.0	29.0	31.0
HAM. WENT. TOTAL	192	204	229	253	273	202	214	226	240
Metro	1,187	1,315	1,410	1,500	1,558	1,244	1,328	1,360	1,385
Durham	90	113	140	180	211	100	122	142	157
York	105	178	235	282	329	147	176	196	216
Peel	237	342	462	550	590	291	370	430	475
Halton	80	93	125	163	211	89	100	113	130
Ham. Wentworth	192	204	229	253	273	202	214	226	240
GTA TOTAL	1,891	2,245	2,601	2,928	3,172	2,073	2,310	2,467	2,603

* 1981 estimated from 1979 data.

Durham

The estimates of both population and employment distribution by area municipality are basically in proportion to the 1991 distribution under each scenario. A somewhat higher growth rate in population is estimated for the Town of Whitby, reflecting the anticipated impact of GO ALRT rail service. The impacts of small changes for Scenario A to Scenario C are distributed among the major southern zones: Oshawa, Whitby, Ajax and Pickering and the same is true for differences between Scenario B and Scenario D.

York

The estimates of population and employment show differential growth rates with substantial growth, as would be expected, in Markham and Vaughan plus significant growth in Richmond Hill, Newmarket and Aurora. Impacts of the changes to Scenarios C and D are distributed principally to the latter three zones except for Scenarios C in 2021 where the rather substantial decrease is distributed across all zones.

Peel

For population, Brampton and the middle zone of Mississauga capture most of the estimated growth, with Brampton reaching the Official Plan target of 344,000 persons by 2011 and the City of Mississauga starting to do the same at about 740,000 persons by 2021 in the A Scenario. It is recognized that further growth could probably be accommodated in either or both of these areas beyond the Official Plan estimates of "ultimate" population (344,000 for Brampton and 745,000 for Mississauga) by expanding the designated urban area but it was felt more appropriate to show "saturation" effects corresponding to the official plans as in the attached estimates. Similar saturation effects are also shown for employment in the A Scenario, with most of the employment growth occurring in Brampton, North Mississauga, and Middle Mississauga. Similar differential growth is shown in the B Scenario, without the saturation effects because of lower growth levels, but with a generally lower rate of growth in the last decade of the planning period as saturation effects might start to be felt. The changes

to Scenarios C and D are reflected almost entirely in the high growth zones, Brampton and Mississauga Middle, and these are both shown as having more population by 2021 in Scenario C than in Scenario A.

Halton

Our estimates assume differentially higher growth in Oakville and Burlington, reflecting the impact of GO ALRT service, for both population and employment. Because of this, it is assumed that Milton East would not be developed in the planning period, even under Scenario A. Burlington is felt likely to saturate at a maximum population of about 220,000 owing to constraining effects of the Parkway Belt West, such that Oakville is estimated to exceed Burlington in population by 2011 and 2021 under Scenarios A and C and by 2021 under Scenario D. The impacts of changes to Scenarios C and D are distributed primarily to Oakville and Burlington, reflecting the GO ALRT impact, with smaller changes in Milton and Halton Hills.

Hamilton-Wentworth

Our estimates for Hamilton assume differentially higher population growth rates for Hamilton Mountain, Stoney Creek and Ancaster under both Scenarios A and B. For employment, the largest increases are anticipated in Hamilton Lower City, Stoney Creek, Ancaster and Hamilton Mountain, under both scenarios. Minor impacts are shown in the two Hamilton City zones for the change to Scenario C in 2021 and to Scenario D in 2001 and 2011.

5. TRAVEL IMPLICATIONS OF THE LAND USE SCENARIOS

5.1 Trip Lengths and Inter-Regional Trip Making

As discussed in Section 3.3 above, both pairs of scenarios show a continuation of past trends to decentralization within the GTA such that the proportion of the GTA's population and employment lying within Metropolitan Toronto continues to decrease. This anticipated decentralization is expected to be more pronounced under Scenario A than Scenario B for reasons stated in Section 3.1, and the relative decentralization of population is expected to be greater than that of employment, for reasons discussed in the same section. Similarly Scenario C would be more decentralized in terms of population than would Scenario D, while Scenarios C and D would be less decentralized than Scenarios A and B, respectively. These trends to increasing decentralization, plus continued growth and infilling throughout the GTA, tend to increase both the amount of commuting and general trip making across regional boundaries and the amount of reverse commuting; that is, travel by persons living in Metropolitan Toronto to jobs in the surrounding regional municipalities.

We would anticipate that the continuing trend toward longer trips, as measured historically in various travel surveys and under the influence of the above land use factors, will be reinforced by the provision of improved transportation facilities and services such as the GO ALRT system and extension of the 400 series of highways. We understand that the preliminary estimates of trip interchanges among the 50 zones will be based upon a "Fratar" expansion of a current trip table to future levels reflecting population and employment growth in each zone. This is a reasonable approach for initial estimates, but it is suggested that a gravity model approach be applied subsequently, when there is more time, since this would allow the impact of improved travel times via GO ALRT and new highways to be taken into account in estimating trip interchanges.

5.2 Choice of Mode

Travellers' choice of mode is influenced by the relative travel times, travel costs and convenience/comfort levels of the available

transportation modes, as assessed in the context of the traveller's trip purpose, income level and car availability. Various studies have shown that the times spent walking and waiting at the beginning and end of a trip and/or when transferring between modes are particularly important in determining modal choice; for this reason, travellers with a choice tend to avoid long bus trips which involve two or more transfers, and automobile users think twice about driving to destinations with high parking costs or long walking distances from available parking spaces.

It is difficult to generalize about likely differences in the modal split between Scenarios A and C on the one hand, and Scenarios B and D on the other. Generally, one would expect that there would be a slightly higher use of public transit in Scenarios B and D, reflecting the lower real incomes, lower car ownership levels, higher gasoline prices and more compact development anticipated in that pair of scenarios.

Modal split estimates are currently being made using a "Delphi" approach, which appears to be reasonable for preliminary estimates, given the limited time available. This approach is useful not only as a systematic means of estimating modal split, but because it brings to bear the joint and several experience of knowledgeable transportation planners throughout the GTA.

It is unfortunate that the 1981 census journey to work survey results are not yet available to assist in this process. We understand that they will be available by about April, 1983 and it would be highly desirable to re-assess both the trip interchange estimates and modal split estimates in light of this information when it becomes available. 1981 employment estimates should also be re-examined at that time.

5.3 Impact of Other Factors

As noted earlier, education trips are expected to be somewhat higher in Scenarios B and D than in Scenarios A and C, while leisure trips are expected to be higher in Scenarios A and C. Because of this, and owing to peak spreading as a result of anticipated greater peak hour road congestion under Scenarios A and C, we anticipate that peaking of work trips and

other trips will be somewhat higher under Scenarios B and D than under Scenarios A and C. Please refer also to the end of Section 2.3 for a discussion of some of these factors.

It seems likely, therefore, that financial performance of the GO ALRT system will be worse under Scenarios B and D than under Scenarios A and C, both because of the lower level of trip making in general and because of the higher peaking factor. We expect that these two influences would tend to outweigh the slightly higher modal split anticipated under Scenarios B and D. More detailed studies are required to assess these impacts in quantitative terms.

6. CONCLUSIONS

6.1 Status and Use of the Land Use Scenarios

As noted in Chapter 1 and elsewhere in this report, the land use scenarios presented in this report were developed expressly on behalf of the MTC as a basis for preliminary estimates of ridership demand on the GO ALRT inter-regional rapid transit service. As such, none of the scenarios is put forward as a "most likely" estimate of development in the Greater Toronto Area. It is felt that the higher growth levels and more extreme distributions of population and employment under Scenarios A and C will provide an "upside risk" ridership estimate for purposes of assessing system design requirements. The more modest growth levels of Scenarios B and D will provide a basis for testing operating requirements and likely financial performance of the system, and the four scenarios taken together provide one indication of the range of uncertainty which must be faced in any long range estimates of this type. It should be noted, however, that the actual range of uncertainty is considerably wider than that defined by the two pairs of scenarios: growth could conceivably be higher than that shown in Scenarios A and C or lower than that of Scenarios B and D.

It is also important to state again that, while planning staffs of the six regional municipalities were extremely cooperative in discussing the assumptions, factors and estimates comprising each scenario, responsibility for the scenarios rests with the MTC and its consultants and not with the regional municipalities.

6.2 Possible Further Work

As mentioned at several points in this report, the great uncertainty inherent in long range estimates of land use and GO ALRT ridership point to the desirability of carrying out systematic sensitivity studies to provide a better understanding of the implications of various factors which could affect the estimates.

In considering the land use estimates, one of the weakest areas of available data is that of employment, for earlier years and even for

1981. When the 1981 census journey to work data become available later this spring it would be highly desirable to re-examine the employment estimates at the regional municipality level in light of this information, and possible impacts of this on future land use estimates.

Additional land use scenarios or variations on those presented here, could also be considered, to test their impact on GO ALRT ridership estimates. A number of possible variations suggest themselves from among the many possibilities including: "uncapping" of growth in Brampton and possibly Mississauga in Scenario A, to allow, say, an additional 150,000-200,000 population growth in Peel by 2021; a reduction of population in Metro Toronto under the B and D Scenarios; greater decentralization of employment from Metro Toronto under any of the scenarios; and possibly a fifth Scenario to test the implications of lower growth if the low fertility rate mentioned in Section 2.3 were to take place and/or lower net in-migration were to occur in the context of lower economic growth. Other possibilities might also be considered and this could be a subject for discussion by TALC during the coming few months as the GO ALRT planning effort takes further shape.

Turning to rideship estimates, the census journey to work information for 1981 when it becomes available later this spring, will also be most useful in establishing average trip lengths and the level of inter-regional commuting in 1981 relative to those for 1971. This information base will also be useful, hopefully, in providing a "base year" estimate of modal split for inter-regional work trips, which may throw additional light on the modal split estimates currently being developed for future years.

As noted earlier, it would also be desirable at that time to make gravity model estimates of zonal interchange volumes, in order to reflect the future impact of reduced travel times via the GO ALRT system and improved highways. Consideration could also be given to making separate gravity model estimates for "white collar" work trips, "blue collar" work trips, and non-work trips, in an effort to distinguish more explicitly among office work trips to downtown Toronto and other regional centres, the

more diffused destinations of non-office work trips and the different spatial and temporal distributions of non-work trips, since all of these factors will influence GO ALRT ridership.

Finally, sensitivity studies of the likely impacts on trip volumes, peaking and modal split of factors such as real income/car ownership levels, gasoline prices, GO ALRT fare levels and structure, parking rates in regional and sub-regional centres and at GO ALRT station parking lots, the degree of fare integration with other transit services, GO ALRT service levels, and peak period highway congestion levels, may also be desirable.

It is recognized that a number of these types of studies will probably be carried out as part of the more detailed assessment of GO ALRT alignments, service levels and station locations. Nevertheless, some such sensitivity studies might desirably precede the detailed alignment/station location studies, as a means of assessing at a more strategic level the types of inter-regional transit service, facilities and pricing which might be most appropriate at various time periods for various parts of the system. This, in turn, will help provide a basis for decisions and more detailed studies regarding the nature and staging of the GO ALRT system.

POOR

QUALITY

ORIGINAL